Inver Grove Heights
Comprehensive Plan

March 2010

Prepared by:

Hoisington Koegler Group, Inc.

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INVER GROVE HEIGHTS

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Introduction

CHAPTER 1

The Metropolitan Land Planning Act requires that local governments within the seven-county metropolitan area review and update their Comprehensive Plans at least every ten years. The last Comprehensive Plan update was completed in 1998. This plan update was completed in 2008 and reflects the planning period of 2010 to 2030. By Statute, plans are required to have specific components as guided by the Metropolitan Land Planning Act. Review of these components are conducted by the Metropolitan Council in order to assess compatibility with metropolitan system plans, consistency with other adopted plans of the Metropolitan Council and compatibility with Comprehensive Plans of adjacent communities and affected jurisdictions.

In addition to complying with the legislative mandate and regional planning requirements, the City of Inver Grove Heights has undertaken this Comprehensive Plan for a far more important reason. The City has chosen to actively plan for its future so that the physical form of the community represents "what the community wants to be" rather than a reaction to trends and patterns that result from outside forces. This plan looks to the future and prescribes a plan and implementation strategy that is intended to provide guidance for decision making for the next 10 to 20 years.

The Comprehensive Plan addresses:

- Vision for the future
- Land use & Economic Development, including phasing for development with urban services and housing and job development opportunities
- Protection of wetlands, trees and other environmental amenities
- Location and character of parks and trails
- Transportation corridors, transit services and infrastructure
- Water, sewer and surface water infrastructure systems

As the guide for community development, the Comprehensive Plan influences many decisions. It is a dynamic document that is regularly reviewed and updated. The Plan:

- Leads to potential modifications of the zoning ordinance and other land use controls
- Influences the form, pace and location of new development
- Promotes the maintenance and enhancement of existing neighborhoods and commercial districts
- Determines and reinforces approaches for protecting natural resources and open spaces
- Guides City investments in roads, utilities and parks
- Determines the need for City roles in economic development, redevelopment and housing
- Establishes a "to do" list of public and private actions

Setting/History

Regional Setting

Inver Grove Heights is located approximately 10 miles south of downtown St. Paul in Dakota County which is one of the 7 principal counties comprising the Twin Cities Metropolitan Area. The corporate limits of Inver Grove Heights encompass approximately 27 square miles. The landscape of the community

consists of a mixture of land formerly used for farming and large tracts of wooded, rolling terrain with well-identified wetland areas. Major water resources consist of various small lakes and the Mississippi River which forms the eastern boundary of the community.

Community History

Bridge 5600

In 1852, pioneers staked claims in an area known as Inver Grove. Attracted by the area's access to the Mississippi River, these settlers from Ireland and Germany quickly established a community. Those of Irish decent clustered their farms along what is now known as Rich Valley Boulevard which had been built by Captain William B. Dodd's military crews from Fort Snelling. Settlers from Germany laid claim to the wooded farmland in the northwest portion of the community clearing and cultivating fields among the area lakes. Other settlers from France and England built homes along the Mississippi River.

In 1853, the first Dakota County Commissioners met at the Mission in the Sioux Village of Kaposia, north of Inver Grove Heights. They established the first school districts in the area and identified the boundaries of the proposed townships. By April of 1858, the Township of Inver Grove Heights was incorporated and the first Board of Supervisors was elected.

From 1858 until 1880, hundreds of settlers were attracted to the township that was named after an Irish fishing village "Inver" and commemorating the homeland of the German settlers, "Grove". By 1880, the area consisted of more than 240 individual farms, four churches, and four school districts.

In 1886, the Chicago Great Western Railroad was built in the township adjacent to the river attracting hotels, taverns, butcher shops and a railroad repair center to an area which became known as the "Village". The Town Board built a town hall and jail and had jurisdiction over the schools in the area. The original town hall was replaced by a second village hall that was constructed on Doane Trail in the 1930s as part of a W.P.A. project. The current City Hall complex was constructed in the 1980s.

As commercial and industrial expansion took place in the late 1880s, people living in the one square mile area adjacent to the railroad separated themselves from the surrounding area by incorporating as the Village of Inver Grove in 1909. The two entities existed side by side for more than 56 years. In that time, farmland changed hands infrequently. The Village on the other hand, benefited from military business stemming from activities at Fleming Field.

Following World War II, another period of immigration took place as residential development reached Inver Grove in the form of the South Grove project. Created out of 200 plus acres of farmland adjacent to Concord Street, south of the Village, the new development area became the home of families in St. Paul who chose to pursue a "life in the country". Fueled by residential growth, fields that once produced potatoes were converted to housing. At the same time, the Minnesota Legislature intervened in the government of both townships and villages by requiring townships either to become annexed to cities or to incorporate as cities. After considerable debate, voters chose to create the City of Inver Grove Heights in 1965 by combining the village and the township into one government entity.

Since the creation of the City of Inver Grove Heights, the area has grown considerably. The supply of vacant land which attracted the original settlers in 1852 is still attracting people today. The community that was started by a few settlers is expected to have a population that exceeds 44,000 by 2030.

Planning Framework

Planning Process

Listening Sessions

This Comprehensive Plan is intended to serve as a guide in making decisions that will affect the City of Inver Grove Heights for the next two decades. In order to be effective, it needs to represent the goals and collective vision of those who it is intended to benefit. The beneficiaries of this plan are the people of Inver Grove Heights, people that live in the community today and people that will make Inver Grove Heights their home in the years ahead. Therefore, the plan must truly represent their thoughts and ideas. Accordingly, the process used to prepare this plan included a wide variety of community involvement opportunities.

A key element of the community involvement process were four "Listening Sessions" that occurred in the early months of 2008. Each session was held to seek public input at the beginning of the process, prior to the time that any development plans were assembled. At this initial stage, the focus of the listening sessions provided the opportunity for attendees to comment on the existing plan and express their wants, needs and desires for the future of Inver Grove Heights.

Each listening session provided the City with a wealth of information that has been used as part of the Comprehensive Planning process. It was clear there

A healthy community is one that:

Preserves and respects its natural environment; balances residential growth with a strong and diverse job base; supports local opportunities for shopping and entertainment; values education systems; offers choice in how we move safely and efficiently throughout our community (walking, biking, driving and public transit); and, provides a variety of active and passive recreational opportunities.

were some common themes that evolved out of the public process. The most common theme was one that developed around the idea of a "Healthy Community." The idea of creating a healthier community is not a new idea, but has gained momentum in recent years. Since the last Comprehensive Plan update, there have been some significant changes in our environment that have highly influenced the health of our community. Some of these changes have ranged from peak oil prices, high home foreclosure rates and a stronger demand for more sustainable options. The degree of some of these recent trends may need to be addressed at a more regional, national or even global level. However, it is important to recognize the local impacts these trends may have on a community. For instance, the increase in oil prices has begun to influence our transportation choices. We may not be able to influence the price increase, but we can begin to explore other multi-modal options. This type of approach begins to embrace the idea of a healthy community that is not solely dependent on the automobile. In that respect, the Comprehensive Plan update has embraced the healthy community concept throughout the chapters of this document.

Vision

Active Living

Inver Grove Heights' Vision and Guiding Principles largely reflect the desired direction towards a healthy community. The vision addresses what the city should be, based on the community's heritage, the natural features that are inherent to the area, and the values of its people. In the context of this plan, vision serves as a reminder of "what Inver Grove Heights wants to be." From time to time, the community will need to review this vision statement to ensure that it continues to focus on the aspirations and achievements that are expected to occur. The planning process for the 2008 update provided an opportunity to critique the vision. The vision sets the stage for establishing goals for the community. The identified vision for the City of Inver Grove Heights is:

Vision Statement

Inver Grove Heights will be a community that maintains a unique position in the Twin Cities area by providing a development pattern that accommodates both urban and rural lifestyles.

Future growth and development will reflect the heritage of the community.
The city will have a quality built environment that respects and reflects its natural environment of open spaces, rolling meadows, wooded areas, lakes and wetlands.

Inver Grove Heights will accommodate the needs of its diverse population by providing a variety of housing types, employment opportunities and a range of goods and services.

Inver Grove Heights will be an attractive, safe community that evokes a strong expression of community pride and a healthy environment in which to live, work and recreate.

Guiding Principles

The principles that have guided Inver Grove Heights over the last ten years continue to serve as statements of criteria by which community development issues can be assessed. For the Comprehensive Plan update, we continue to embrace these principles which have been reinforced through the public input process.

Together, the guiding principles and the vision serve the following purposes:

- They orient the community to the future, even to a future that is twenty years distant.
- They require imagination, recognizing that the direction that they set today will be the reality of the future.
- They look to current conditions and community traditions for clues to the appropriate future.
- They are based on a shared understanding of what the community desires for itself.
- They will be used as tools for evaluation of proposals, projects, ideas and future directions.
- They will be an anchor during conflict, a way of finding common ground and shared values.
- They become a basis for coordination and cooperation.
- They are a source of energy and enthusiasm for maintaining a commitment to the future of Inver Grove Heights.

Sustainability

Sustainability is a characteristic that is often used to describe how we see our future communities, or a state that can be maintained at a certain level indefinitely. The Brundlant Commission (also known as the World Commission on Environment and Development) coined the term Sustainable Development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The notion of sustainability is woven throughout all of our plan, beginning with the guiding principles and continuing on through the goals and policies.

The guiding principles are an important tool to be used in addressing future issues in Inver Grove Heights. They can be used as a conceptual yardstick in assessing future projects, developments and issues. While the community's plan will continue to evolve over time and modifications will be necessary to accommodate unforeseen circumstances, it is important that the spirit and intent of the guiding principles be upheld. In doing so, they will help to ensure that the steps that Inver Grove Heights has taken in preparing this Comprehensive Plan produce the desired results. The guiding principles include the following:

Guiding Principles

- **Maintain a Unique Identity**

Inver Grove Heights has evolved into a unique community, an element of pride to the City's residents. Factors that establish Inver Grove Heights as a unique community, including its sense of history, its location along the Mississippi River and its natural features, will be reflected in future growth.

- **A Well Balanced Tax Base**

Inver Grove Heights will preserve its fiscal integrity by maintaining a mix of land uses that result in a balanced tax base. A proper mix of land uses in the community will provide desired employment, goods and services while helping to maintain manageable residential tax rates.

Residential Variety

- **Provide Diverse Services**

Inver Grove Heights residents seek a community that can meet all of their social and consumer needs. These needs and interests will be considered in defining a future mix of land uses and public services.

- **Residential Variety**

Residential developments containing a variety of housing types are encouraged where possible. Neighborhood areas will provide a mix of housing that affords residents the opportunity to move into alternative forms of housing as their needs change over time.

Retain the Rural Character

- **Retain the Rural Character**

Inver Grove Heights rural character is evident in the development pattern that exists today. Future development will reflect the community's rural heritage by providing open spaces and by protecting key natural features.

- **Connected Parks and Open Space**

The environment in and around Inver Grove Heights presents a number of unique recreational opportunities. Inver Grove Heights will provide a balanced park system that is connected within the City as well as being linked to regional points of interest in the area.

Connected Parks & Open Space

- **A Pedestrian Friendly Commercial Core**

Inver Grove Heights will establish a pedestrian friendly commercial core. Pedestrian circulation will be inviting, continuous and barrier-free to provide safe and easy access for non-vehicular circulation.

Planned Office & Industrial Areas

- **Planned Office and Industrial Areas**

Efforts will be made to provide planned office and industrial areas in Inver Grove Heights. Such uses will be sited carefully to preserve natural features while creating employment opportunities within the City.

- **Quality Infrastructure**

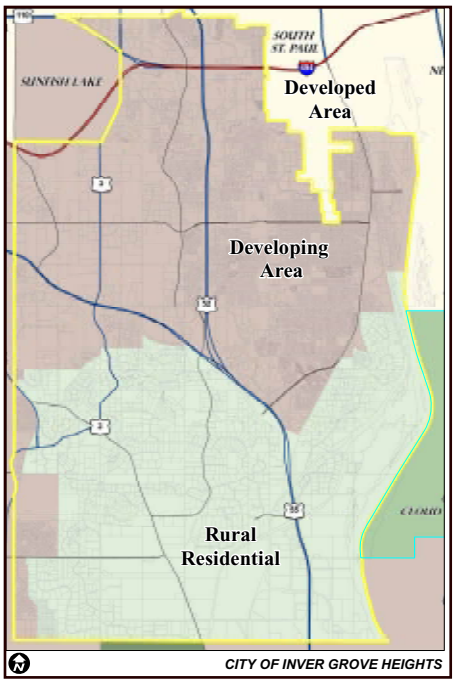
Inver Grove Heights will maintain a high quality, efficient infrastructure system. Utility, transportation and services delivery systems will serve both the present and future needs of the community. Infrastructure expenditures will be made on the basis of long-term costs and benefits rather than solely on initial cost.

- **Maintain Educational Excellence**

Inver Grove Heights has an excellent educational system for both primary and secondary education. Future planning of public and private facilities will keep pace with the technological advances necessary to support educational institutions.

- **An Attractive and Safe Environment**

The community will continue to emphasize an attractive and safe environment that affords residents the opportunity to get to know their neighbors. Public and private gathering spaces located throughout the community will accommodate formal and informal gatherings, which help support a strong sense of community.



2030 Metropolitan Council Regional Development Framework. Note that since the adoption of the Regional Development Framework, the City of Inver Grove Heights has completed two amendments to its plan which extend urban services along the Highway 52 corridor: the Cahill South extension completed in 2006 and the Southern Sanitary Sewer extension completed in 2007.

2030 Regional Development Framework

In its 2030 Regional Development Framework, the Metropolitan Council characterizes Inver Grove Heights in two planning area designations: 1) Developing Community and 2) Rural Residential. The Met Council's definition of these areas are as followed:

Developing Community: This category reflects those areas of the community that currently receive municipal sewer and water services and are projected to accommodate future urban growth in the region. Areas across the metropolitan region identified as "developing community" are anticipated to be the recipient of the projected growth through the year 2030. The northern two thirds and a few slivers of land on either side of the city are identified with this designation.

Rural Residential: Rural Residential Areas are those areas not intended for future municipal sanitary sewer, and likely not municipal water service either. These areas are mostly characterized by large lot (2.5 acre plus) residential lots and estate type development. Rural Residential Areas face challenges in making the transition from rural unsewered development to sewered development. As the Metropolitan Council updates its system plans, the feasibility of providing regional wastewater services, in conjunction with local water supply and transportation system improvements, will continue to be examined. Regional policy directives in Rural Residential areas are focused on protecting and enhancing environment and natural resources, ensuring sufficient public infrastructure, and discouraging further growth of this type of land use pattern. This area includes the southern 1/3rd or so of Inver Grove Heights.

Population, Households and Employment

Introduction

Demographic data is an important component to understanding the make-up of a community. More importantly, it also identifies existing and future trends occurring in the community. The 2000 U.S. Census provides us with a foundation to understanding the demographic make-up of Inver Grove

Heights. The Comprehensive Plan update will be completed prior to the 2010 U.S. Census data that would provide a more current depiction of Inver Grove Heights. Additional information on the community's demographics in 2008 may be found through other sources such as the School District or State Demographer. A comprehensive inventory of demographic data can be found in Appendix A.

Growth Projections

This section focuses on a set of market observations and projections that are intended to help quantify various components of future growth in Inver Grove Heights. A part of the foundation for the Comprehensive Plan update has been the population, housing and employment forecasts generated by key regional and state agencies including the Minnesota Demographer, the Metropolitan Council, the Minnesota Department of Employment and Economic Development and Dakota County. All of these agencies use varying methods to project how much growth is going to occur in the region, and how much of that growth will be absorbed within the City of Inver Grove Heights. In each case, methodologies take into consideration a number of factors including Inver Grove Heights' current plans for growth and available land supply, but at a very general level. Dakota County has completed two studies in the last three years that document some of this methodology: 1) Comprehensive Housing Needs Assessment for Dakota County (November 2005), and 2) A Market Study for Commercial and Industrial Space in Dakota County (February 2007) prepared by Maxfield Research Inc. As a result of the varying methodologies, the projections will vary between each agencies projections.

Table 1.1: Population, Households and Employment represents the City of Inver Grove Heights projections based on our Comprehensive Plan update. The projections were developed by understanding existing land use and development capacity on a parcel by parcel basis and developing a set of assumptions regarding development density, population and employment ratios by land use type, phasing of infrastructure improvements and property ownership patterns. All of these assumptions were developed based on sound planning principles and an understanding of recent market trends. The projections in this plan do not match exactly with any of the agency projections referenced above; however, the projections do generally fall within an acceptable range of deviation. This plan update recognizes that achieving these projections will be a product of a number of factors that are beyond the control of Inver Grove Heights. It is conceivable that development could greatly exceed our expectations, particularly in the employment estimates.

It is also conceivable that the economy has a slower recovery and we fall short of our projections. In either case, it should be understood that these projections will serve as a basis for planning to the year 2030, while our land use plan will look at what the community might become upon being fully built out. As mentioned early on in this document, Comprehensive Plans are dynamic documents, and as we learn more, we need to carefully monitor demographic trends to ensure our community remains sustainable.

Table 1.1: Population, Household and Employment Projections

Totals	2000	2010	2020	2030	Change 2000 to 2030
Population	29,751	33,910	40,540	47,260	17,510
Households	11,257	14,010	16,990	19,250	7,990
Employment	8,168	12,000	14,700	17,900	9,700

Source: Hoisington Koegler Group Inc. (see Appendix A for a detailed set of data and assumptions.)

Planning For Growth

Additional analysis and support of the projections will be presented throughout the remainder of the Comprehensive Plan. These projections provide a key foundation element for land use, park and recreation, roadway and infrastructure system planning.

Population

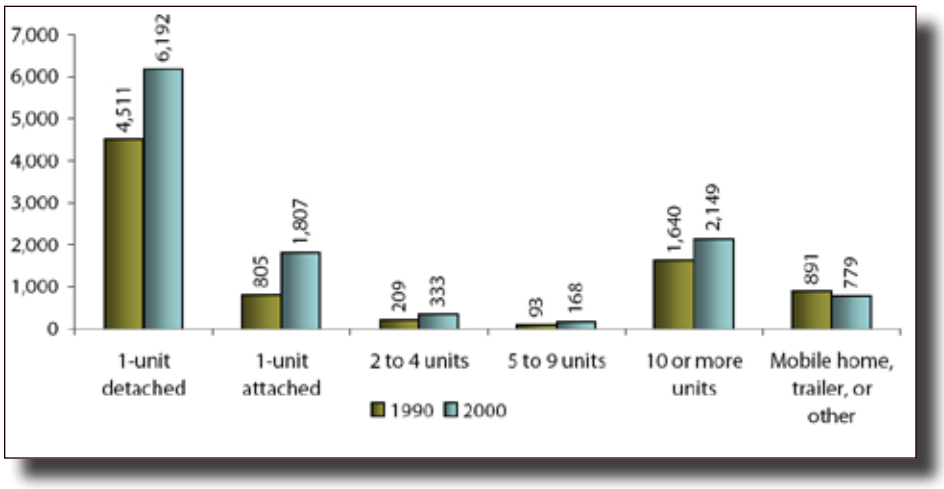
Inver Grove Heights has continually seen growth in population over the years. The City gained slightly more than 5,300 persons during the 1980's, a growth rate of nearly 31%. Growth continued between 1990 and 2000 adding approximately 7,285 people, which accounted for a growth rate of 32% and saw the population in 2000 approaching 30,000. The State Demographer estimated the population in 2006 to be at 33,139.

It is anticipated that for the next 20 years, Inver Grove Heights will continue to see a moderate growth in population as a result of growth in the Northwest Area and continued infill on undeveloped lands. It is expected that growth will likely peak in the 2020 decade as available land becomes more scarce.

Housing

The housing market has seen some significant changes since the last round of updates in 1998. Most recently there has been a significant increase in

home foreclosures, a higher demand for rental units and a slowing economy. These recent trends have posed some significant challenges to communities in the region and nation. Before a slowing economy, Inver Grove Heights saw a significant increase in new households from 8,149 units in 1990 to 11,257 units in 2000. Between 2001 and 2007 the City reported 962 new residential units, resulting in a net total of 12,414 residential units. An additional 5,250 units are projected to be constructed between the year 2010 and 2030, an average of roughly 260 units per year. Regardless of the current market conditions, the Comprehensive Plan will continue to follow these forecasts and plan for them accordingly throughout the Comprehensive Plan.



Housing Types
Source: 2000 Census

As previously noted, a study was completed for Dakota County in November of 2005 titled "Comprehensive Housing Needs Assessment for Dakota County." This study builds off of the regional forecasts and provides recommendations on the amounts and types of housing needed to meet housing demand over the next 15 years. The study has identified Inver Grove Heights as a "Developed Community," along with Eagan, Burnsville, Mendota Heights, Lilydale, West St. Paul, South Saint Paul and Sunfish Lake. Inver Grove Heights is expected to absorb the bulk of new single-family homes constructed in these "developed communities" between 2010 and 2020 largely as a result of the available vacant land in the Northwest Area.

Additional information on the housing can be found under the Housing Chapter.

Employment

Table 1.2 presents employment growth trends among Inver Grove Heights and other Dakota County communities from 1980 to 2030 as prepared by

Inver Grove Heights Housing (1)

Inver Grove Heights Housing (2)

Maxfield Research on behalf of Dakota County. The table demonstrates that job growth in Inver Grove Heights has been relatively strong in comparison to other Dakota County communities. Additional job growth is anticipated to continue based on the available land supply in the Northwest Area and the major transportation corridors available to Inver Grove Heights. The Maxfield Research report's projections for Inver Grove Heights are aggressive relative to the Comprehensive Plan projections; however, it is important to highlight the potential job growth based on a methodology that is more heavily based on market trends.

Table 1.2: Employment Trends and Forecasts

	Employment					Change 1990 - 2010		Change 2010-2030	
	1990	2000	2010	2020	2030	No.	Pct.	No.	Pct.
Large Communities									
Apple Valley	6,528	12,106	15,200	18,100	20,000	8,672	132.8	4,800	31.6
Burnsville	25,438	31,765	35,300	37,800	39,300	9,862	38.8	4,000	11.3
Eagan	26,000	42,750	58,300	65,700	69,900	32,300	124.2	11,600	19.9
Farmington	2,342	3,986	5,300	6,500	7,500	2,958	126.3	2,200	41.5
Hastings	6,982	8,872	9,800	10,100	10,800	2,818	40.4	1,000	10.2
Inver Grove Heights	5,724	8,168	13,700	18,100	20,500	7,976	139.3	6,800	49.6
Lakeville	6,563	10,966	18,600	24,900	29,800	12,037	183.4	11,200	60.2
Mendota Heights	5,805	8,549	12,400	14,000	15,200	6,595	113.6	2,800	22.6
Rosemount	4,114	6,356	8,000	9,700	11,100	3,886	94.5	3,100	38.8
South St. Paul	5,564	7,697	8,600	9,200	9,600	3,036	54.6	1,000	11.6
West St. Paul	9,264	8,905	8,800	9,000	9,100	-464	-5.0	300	3.4
Subtotal	**104,324**	**150,120**	**194,000**	**223,100**	**242,800**	**89,676**	**86.0**	**48,800**	**25.2**
Remainder of Co.	1,705	4,122	4,231	4,340	4,850	2,526	148.2	619	14.6
Dakota County	**106,029**	**154,242**	**198,231**	**227,440**	**247,650**	**92,202**	**87.0**	**49,419**	**24.9**
Metro Area Total	1,272,773	1,563,245	1,815,715	1,990,485	2,125,965	542,942	42.7	310,250	17.1

Sources: Metropolitan Council; Maxfield Research Inc.

Source: A Market Study for Commercial and Industrial Space in Dakota County. Prepared for the Dakota County Community Development Agency. Maxfield Research. April 2008.

There is a growing trend toward flextime, home-based businesses, and telecommuting. As more and more workers utilize their residences as part-time offices, there will be less of a demand for traditional office space. The average amount of office space per worker will continue to decline over the long-term as we become more efficient with our space. In the short-term, over the next ten years, it is unlikely there will be a substantial reduction in the demand for commercial space.

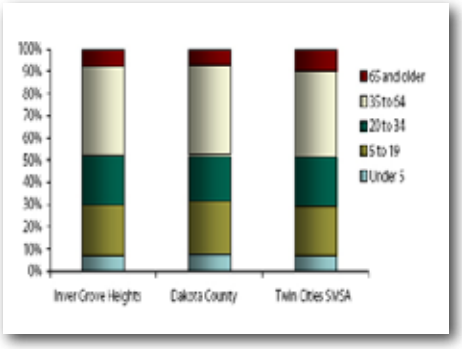
Age Distribution

In most cases communities are dealing with an aging population as a result of the "baby boom" generation. In 2000, baby boomers were ages 36 to 55, which made up approximately 32% of the population. Age groups above 55

made up another 16% of the community, resulting in the remaining 52% of the population under the age of 35.

The distribution of age groups can tell a lot about a community. They can provide a better understanding for anticipated housing needs, social services, school enrollment and other public amenities. The current make-up of Inver Grove Heights indicates that there is a fair distribution of age groups. This is not surprising considering the fact that Inver Grove Heights is still a developing community.

Young or old, the make up of a community is somewhat uncontrollable. Planning decisions must consider all age groups to ensure a community is a desirable place to live, work and recreate in.



Age Distribution
Source : 2000 Census

School Enrollment

One of the most reliable sources for up to date demographic data is provided through our school enrollment information. During the 2007 and 2008 school year the Minnesota Department of Education reported Inver Grove Heights Schools to have enrolled 3,713 students. Compared to previous school years this number has fluctuated, but more recently there has been a decrease in enrollment (1990: 3,615 and 2000: 4,047). It is unclear at this time if this is indicative of a reoccurring trend. However, it is assumed based on forecasted growth the schools will begin to see an increase in enrollment.

Planning For All Ages

Household Income

Median household income rather than average household income is a better reflection of the majority of households, because average household incomes can be skewed upward by a few, very high-income households.

As of 1996, 50.0 percent of the households in Inver Grove Heights were estimated to have annual household incomes between $35,000 and $74,999. In the last three years the percentage has decreased to 41%. The percentage of lower income households has also decreased. Homes estimated to have incomes between $25,000 and $34,999 decreased from 14.1 percent to 11.45 percent in 1999. Higher income households were also on the rise in 1999. 14.81 percent of Inver Grove Heights' households were estimated to have incomes between $75,000 and $149,99 in 1996. In 1999 this rose to 31.50 percent.

The statistics shown above indicate that households in Inver Grove Heights have seen some prosperity over the last several years. The following table represents income data as reported by the 2000 Census.

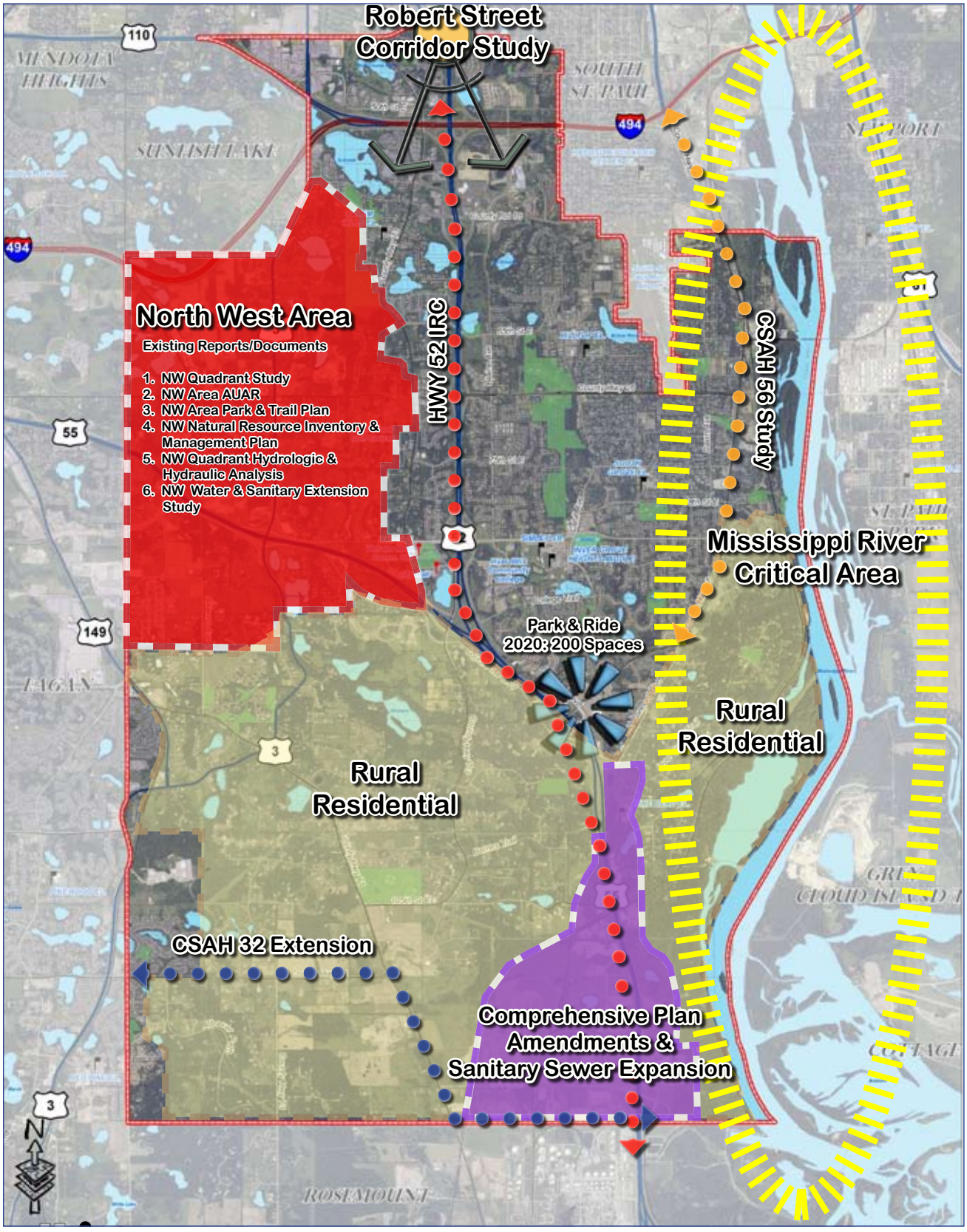
Table 1.3: Income Data from 2000 Census

	Inver Grove Heights	Dakota County	Twin Cities SMSA
Median Household	$59,090	$61,863	$54,304
Median Family	$68,629	$71,062	$65,450
Per Capita	$25,493	$27,008	$26,219

2030 Comprehensive Planning Context

Our planning process for updating the Comprehensive Plan did not start from scratch. Since the last update to the Comprehensive Plan completed in 1998, a significant amount of planning work has been completed that provides the context for this Comprehensive Plan Update. This work includes regional planning efforts completed through Dakota County agencies, MnDOT, the Corp. of Engineers, and collaborative efforts with neighboring cities. Figure 1.1 illustrates the various efforts and issues that will be addressed in the remaining elements of this Comprehensive Plan update.

Figure 1.1: Planning Context for the 2030 Comprehensive Plan Update



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Land Use
CHAPTER 2

Introduction

Inver Grove Heights borders the cities of Eagan, Sunfish Lake, Mendota Heights, West St. Paul, South St. Paul, Newport, St. Paul Park, Grey Cloud Township and Rosemount. Since settlement started in the area in 1852, the development pattern of Inver Grove Heights has extended west and southwest from the original Village on the Mississippi River in what is now generally known as the Concord neighborhood. The pace of development in the area increased during the 1970s and 1980s in response to improved accessibility provided by major freeways including I-494, TH 55 and the Lafayette Freeway (Highway 52). The City has a total land area of approximately 19,217 acres and because all land bordering the community is incorporated, Inver Grove Heights' boundaries are fixed.

In 1998 approximately 40% of the City had municipal sanitary sewer as provided through the Metropolitan Urban Service Area (MUSA). That number has grown to nearly 60% in 2008 as a result of recent Comprehensive Plan Amendments (CPA) to the 1998 plan. The most recent CPA was titled Highway 52/55 MUSA Expansion and was approved by the Metropolitan Council and amended by the City Council in the spring of 2008. Generally speaking the only portions of the community that are not intended to receive future public water and sanitary sewer services are those areas guided for rural residential land uses. The Land Use plan discusses these areas in further detail and a area around the refinery and landfill uses in Southern Inver Grove Heights.

Metropolitan Urban Service Area

The Metropolitan Urban Service Area, or "MUSA," is the area in which the Metropolitan Council ensures that regional services and facilities, such as sewers and major highways, are provided or planned. The Metropolitan Council oversees provision of these services to metro-area communities under the authority of the Metropolitan Land Planning Act. A planning concept developed in the 1970s, the Metropolitan Urban Service Area was designed to achieve orderly, economic and contiguous growth by directing development, primarily, to areas where roads and sewers already exist. The objective was to get the most use out of existing infrastructure and create efficiencies that save taxpayer dollars.

Existing Land Use Classifications

Describing existing land use enables us to take a snapshot of our current community as a basis for measuring our future land use plan. The following categories represent how our lands are currently being used.

Rural Residential – Rural Residential is primarily located in the southern portion of the community outside the MUSA boundary. These uses consist primarily of large lot, estate residential housing with private on-site septic and well systems. Limited agriculture or rural hobby related uses are often included in this land use category.

Urban Single Family Residential & Manufactured Homes – Existing residential uses include single-family, detached housing, which on the basis of land consumption, is the dominant land use category in the community.

Multi-Family Residential – Multi-Family Residential includes all categories of attached housing such as apartments, condominiums, townhomes, duplexes, triplexes, quadhomes, senior housing, and manufactured housing.

Commercial – Commercial uses are those that supply goods and services to the general public.

Office – The office category includes commercial office buildings that provide space for a variety of business practices.

Industrial – Uses classified as industrial are those that create employment opportunities through manufacturing, assembly, warehousing and similar operations.

Institutional – Institutional uses include public lands and facilities such as City Hall, the community center, public works and schools. This category also includes religious institutions such as churches and cemeteries.

Extractive – Extractive uses include lands being used for mining purposes.

Public Park and Open Space– Land classified as public parks and open space provide a variety of recreational opportunities. This category includes publicly owned golf courses, publicly owned open space and city parks.

Private Recreation Areas—land classified as private recreation includes uses that are largely undeveloped but used for recreation. These spaces might include privately owned golf courses, gun clubs, conservation areas, association owned common area or other lands not intended for further development.

Utility — Utility represents private utility infrastructure facilities.

Railroad – Railway property includes land within railroad right-of-way.

Open Water/ Wetlands – This category includes wetlands, lakes and the Mississippi River.

Vacant – Lands classified as vacant are parcels that do not contain developed land uses. Vacant parcels may be property that is currently under utilized or land that is presently used for agricultural purposes.

Right-Of-Way (ROW) – ROW include public right-of-way that is currently used for roadways or is available to accommodate public roads in the future.

The existing land use map depicts the current land use pattern in the City of Inver Grove Heights. Table 2.1: Existing Land Use Inventory provides a detailed breakdown of existing land use.

Existing Residential Land Use

The age and styles of housing combined with their corresponding lot sizes have resulted in a number of distinctly different neighborhoods. The residential area in the Concord neighborhood, which is located in the extreme northeast portion of the community, contains some of the oldest housing stock in Inver Grove Heights. A unique bluff line paralleling the Mississippi River provides much of the context to this area. Neighborhoods east of Concord Boulevard at the bottom of the bluff have smaller lots and are situated on a grid pattern of streets. Neighborhoods west of Concord are constrained by steep topography of the bluff and thus are quite unique in their design. On top of the bluff, the residential area to the west, north of 80th Street and east of the Lafayette Freeway contains neighborhoods that were platted in the 1970s and 1980s and feature curving streets and frequent cul-de-sacs. Housing located south of 80th Street in the Arbor Point development is more typical of planned unit developments that were completed in the 1980s and

The Pines

Table 2.1: Existing Land Use Inventory (2008)

Land Use Category	Currently within Urban Service Area (MUSA)	Currently outside Urban Service Area	Total	% of Total
Rural Residential	1,889	3,947	5,836	30%
Urban Single Family Residential	2,054	-	2,054	11%
Single Family/ Manufactured Homes	145	-	145	1%
Multi-Family Residential	675	-	675	4%
Commercial	423	-	423	2%
Office	54	-	54	0%
Industrial	1,036	118	1,154	6%
Institutional	339	27	366	2%
Extractive	101	149	250	1%
Public Park and Open Space	770	160	930	5%
Private Recreation and Open Space	236	557	793	4%
Utility	155	1	156	1%
Railroad (owned but not ROW)	14	3	17	0%
Open Water/Wetland	796	829	1,625	8%
Vacant	797	1,144	1,941	10%
ROW	NA	NA	2,830	15%
Total	9,486	6,934	19,250	100%

early 1990s. The residential character of this area is established by varying housing styles and densities, a connected open space system, trails, tear drop cul-de-sac islands, higher levels of landscaping and entry signs that identify neighborhoods.

The rural density residential area in Inver Grove Heights generally lies south of Highway 55/52 and southeast of Concord Boulevard. Housing styles and sizes in this single-family detached area vary. Lot sizes range from 1 acre to more than 10 acres with significant clusters of 2.5 acre and 5 acre lots. Some of the housing developments have a rural subdivision character with mowed lawns surrounding all of the homes. Other areas contain hobby farms or houses that are set within rugged, wooded terrain.

The existing land use map contains three residential classifications, rural, single-family and multi-family. Homes in the rural and single-family classification are all detached dwelling units while homes in the multi-family classification are primarily attached or stacked (vertical) housing units.

Existing Commercial Land Use

Inver Grove Heights contains pockets of commercial development that have either a regional orientation or are older commercial areas that primarily serve the local residential population. Regional commercial uses are located in the northwest corner of the community and in the southeast quadrant of the I-494 and Lafayette Freeway interchange. The northwest corner commercial area contains automobile dealers and large scale retail stores. In the southeast quadrant, commercial development began in 1997 with the construction of a theater complex and peripheral land uses.

Retail Services

Smaller, commercial uses (oriented as "nodes" typically at the intersection of two major roads) make up the balance of the commercial land use pattern in Inver Grove Heights. Examples of these areas include Cahill Avenue at 55th Street, 65th Street, 70th Street, 80th Street and most recently near the intersection of Concord Boulevard and Lafayette Freeway. Commercial uses in these areas include fuel stations, fast food restaurants, offices, grocery stores, drug stores, hardware, video rentals and recreational uses such as bowling. The dispersed pattern of these commercial uses makes it difficult to combine them into a cohesive focus for commercial activity. However, the nodal distribution serves to help diminish the length of trips for basic services in the community.

Office Condos

Existing Industrial Land Use

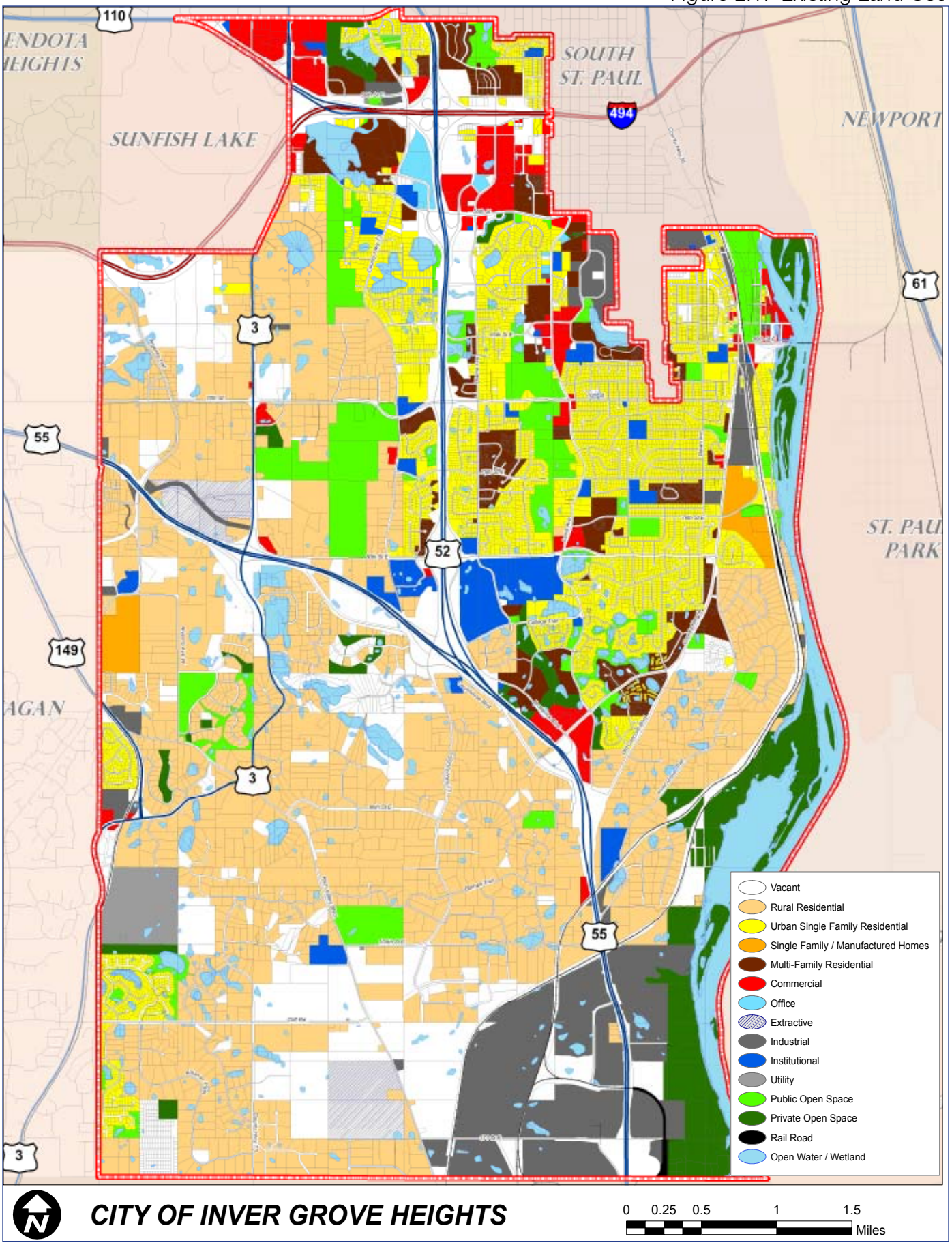
In 2008 the City's MUSA was expanded along the TH 52/55 corridor to encompass land guided for light and general industrial uses. The recent expansion has provided the city with an opportunity to increase its commercial/industrial tax base and employment opportunities.

Concord Boulevard

Businesses in this area tend to be manufacturing and assembly operations on larger lots, many of which have associated outside storage. The largest single land uses include the landfill operation and an underground natural gas storage facility. The entire southern tier of land in Inver Grove Heights is also impacted by the refinery operation (currently owned by Flint Hills Resources) that is located across the border in the City of Rosemount. These industrial uses generate low employment compared to other industrial uses in the community.

Another area of industrial land use lies in the northeast corner of the community, generally around the South St. Paul airport. Industrial uses in this area tend to be individual businesses that are involved in light manufacturing, assembly

Figure 2.1: Existing Land Use



and warehousing operations. The stretch of old Concord Boulevard north of 70th Street is also the home of a number of smaller industrial businesses. In general, businesses in this area tend to be very small manufacturing or assembly operations, sometimes creating conflicts with the surrounding residential areas. These types of industrial uses do generate a greater degree of employment than industrial uses south along Highway 52.

Dakota County
Inver Glen Library

Institutional

Uses categorized as institutional include a number of different types of public and semi-public uses. Most of the institutional land in Inver Grove Heights is developed land occupied by public or private schools, religious institutions, or facilities associated with the government such as City Hall, Veterans Memorial Community Center, state or county facilities.

Public Parks and Open Space

Park and open space areas that are operated by the City are delineated on the existing land use map. These areas include lands used for active or passive recreation use or lands that are in public ownership and are preserved as open space or conservation areas. Trail right-of-way would be included in this category also. The key distinguishing feature is that the land is held in public ownership.

Farmers Market

Private Recreation and Open Space Areas

This is a new category used to characterize existing use of land in Inver Grove Heights. Land used for private recreation purposes that are "land" intensive (i.e. a small proportion of the site is needed for structures) whether passive (i.e. open space, nature areas, etc…) or active uses (i.e. gun club, golf course, park) are classified as private recreation areas. These areas, while possibly available for public use, are always owned by a private entity and not intended for development in the near term. Generally, these lands are not included in determining development capacity of the City.

Vacant

Vacant areas include undeveloped land, portions of which are currently used for smaller scale farming operations. It is anticipated that these lands will be developed at some point in the future when property owners choose to.

Peripheral Uses

The existing land use pattern in Inver Grove Heights is impacted by a number of facilities that lie outside of its municipal boundary. These uses are not mapped, but they are important to recognize due to the impact on nearby land uses. Of these types of uses, the most dominant ones are airports and refineries. Refineries in Rosemount and St. Paul Park are easily seen from properties located in southern and eastern Inver Grove Heights. Both of these uses are visually unattractive. They have both direct and indirect negative impacts on the use of land for residential purposes either due to visual concerns or proximity to some of the heaviest industrial uses in the entire Twin City Metropolitan Area.

The refinery located in Rosemount also has another type of direct impact on Inver Grove Heights. For many years, this refinery has been purchasing property in Inver Grove Heights to serve as a buffer for its refining operations in Rosemount. Company ownership in this area creates an uncertainty of future use regarding large parcels of land in southern Inver Grove Heights. Because the refinery generates a significant employment base that is nearby to Inver Grove Heights, this comprehensive plan update will offer directions on how to balance the issues identified and meet the needs of both the City and refinery business.

Airports are also a negative impact on existing residential development in Inver Grove Heights. The South St. Paul Airport is a small scale, general aviation facility with limited impact due principally to the lower intensity scale of airport operations. The Minneapolis/St. Paul International Airport, however, is another matter. Because of the extensive nature of commercial operations at MSP and the flight patterns that route departing and arrival traffic directly over the city, noise from airport operations impacts both existing and future residential developments. Although current construction techniques are able to sound proof homes so that they can co-exist, there is a sentiment from some residents that future development in areas impacted by airport noise should not be permitted.

Both airport facilities, however, provide services to Inver Grove Heights that can be perceived as much more of an asset than a liability. These services support hobby and leisure activities, jobs and economic development opportunities.

2030 Future Land Use Plan

Residential Land Use

The Future Land Use Plan identifies five categories of residential land development including rural density residential (RDR), low-density residential (LDR), low-medium density residential (LMDR), medium density residential (MDR) and high density residential (HDR). The following is a review of each classification:

Rural Density Residential (RDR)

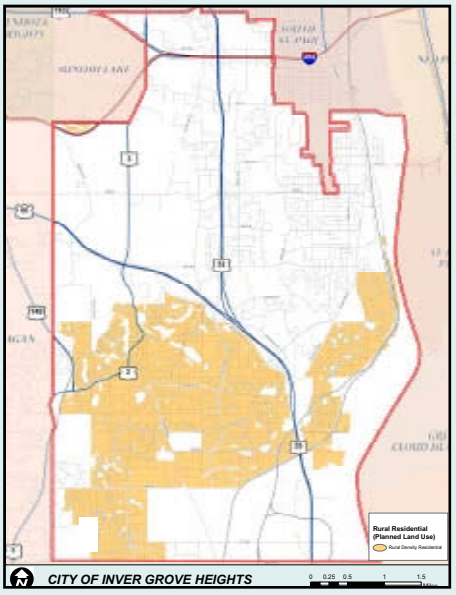
The rural density residential category is used in this comprehensive plan to recognize a land use pattern that has become firmly established in the southern portion of Inver Grove Heights. Over the past four decades, single-family home development on lots ranging from 2.5 acres to in some cases, 10 acres has become an established pattern in southern Inver Grove Heights. At the present time, this area contains over 1,600 residences, none of which are served by municipal utilities. Because of the extensive nature of the rural density residential area and the City's desire to accommodate a wide range of housing types, this development pattern is being considered permanent and it is anticipated that future infill development will match the existing pattern.

The rural density residential category features lots or parcels of 2.5 acres or more containing detached single-family housing without public water or sanitary sewer facilities. In addition to housing units, lots in this area are likely to have accessory uses such as small storage buildings associated with hobby farms and other related uses.

Substantial areas of existing development in the rural density area contain lots ranging from 5 to 10 acres. As additional lots are platted adjacent to these areas in the future, proper transitioning of lot sizes will need to be considered.

Low Density Residential (LDR)

The low-density residential category encompasses traditional "urban" density development in Inver Grove Heights. LDR includes lots or parcels ranging from 1 unit per acre to 3 units per net acre. Substantial portions of the low-density residential area are anticipated to develop at a density of one to three units per net acre. Housing types in the low-density residential



Rural Density Residential

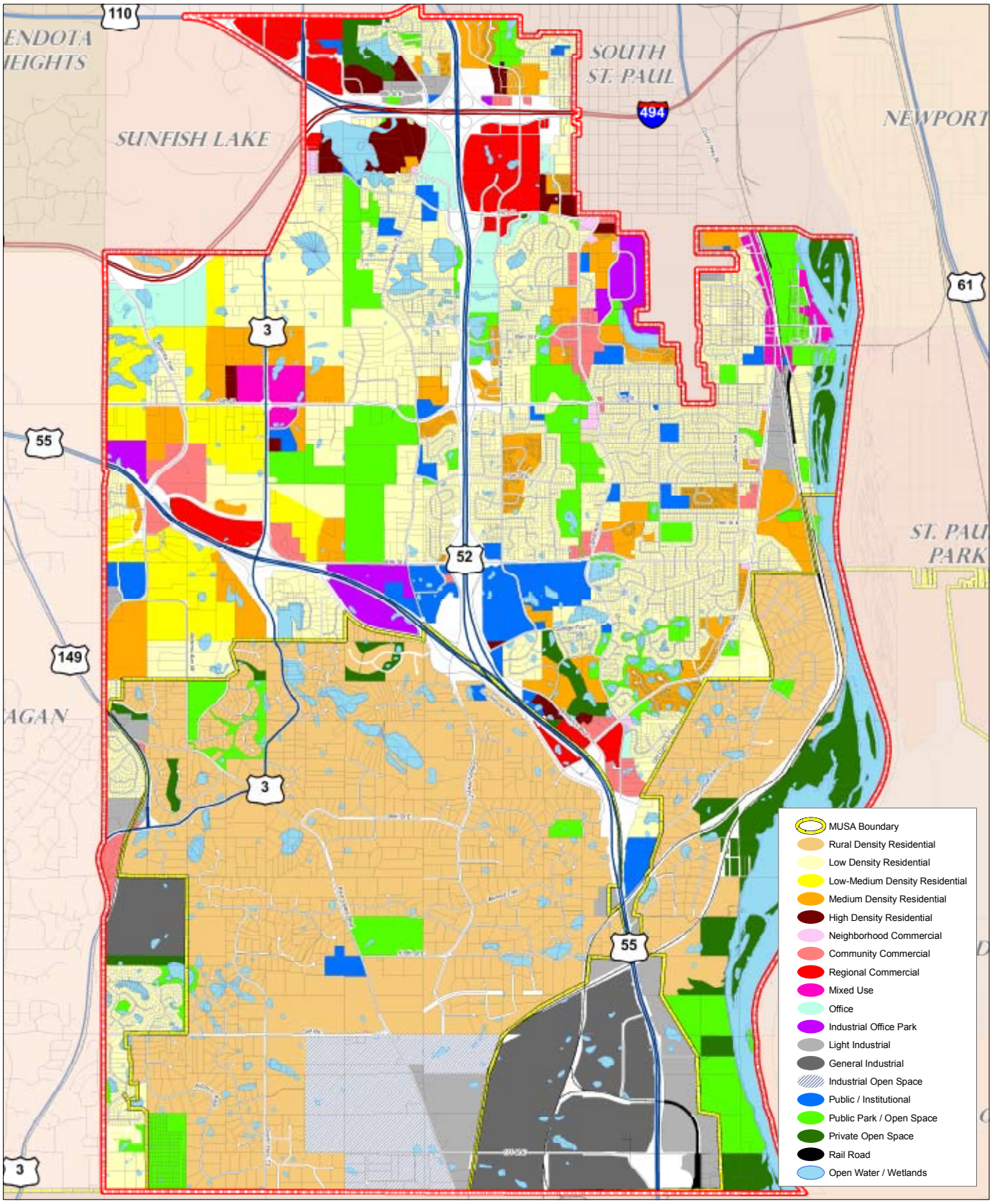
As additional lots are platted adjacent to these areas in the future, proper transitioning of lot sizes will need to be considered.

Determining Density :

Density is a way of determining the degree of development on a specific parcel based on the future land use guidance. We receive guidance from the Metropolitan Council on how to determine appropriate density calculations in Comprehensive Plans. The Metropolitan Council establishes these guidelines to ensure a consistent way of measuring density across all communities in the Metropolitan Area. This enables a consistent and coordinated way to allocate future growth and development that affects regional infrastructure planning.

Density for sewered areas is calculated on a "net" basis meaning that development projections are based on a land's carrying capacity which does not include land area prohibited from development based on existing laws or ordinances or lands needed for arterial road ROW.

Figure 2.2: Land Use Plan



CITY OF INVER GROVE HEIGHTS

0 0.25 0.5 1 1.5
Miles

category include single-family detached homes, twin home units and lower density, townhome style developments. In all cases, low-density residential development will be served by public water and sanitary sewer systems.

Low-Medium Density Residential (LMDR)

The low-medium density residential category includes a combination of single family attached and single family detached housing that is generally at a greater density than traditional single family housing in Inver Grove Heights. Density of the LMDR category ranges from 3 to 6 units per net acre. This land use category is principally isolated to the Northwest Area and is a new land use category.

Table 2.2 2030 Future Land Use Calculations (in Acres)

Land Use	Currently within Urban Service Area (MUSA)	Currently outside Urban Service Area	Total	% of Total
Rural Residential	22	4,581	4,604	24%
Low Density Residential	3,176	8	3,184	17%
Low Medium Density Residential	567	-	567	3%
Medium Density Residential	961	-	961	5%
High Density Residential	168	-	168	1%
Neighborhood Commercial	27	-	27	0%
Community Commercial	250	2	251	1%
Regional Commercial	351	12	363	2%
Mixed Use	119	-	119	1%
Office	213	-	213	1%
Industrial Office Park	194	-	194	1%
Light Industrial	354	141	495	3%
General Industrial	871	0	871	5%
Industrial Buffer Area	-	513	513	3%
Public / Institutional	405	28	432	2%
Public Open Space	792	408	1,200	6%
Private Open Space	175	410	585	3%
Railroad	20	3	24	0%
Right-Of-Way	NA		2,882	15%
Open Water / Wetland	NA		1,597	8%
Total	9,433	6,935	19,250	100%

Medium Density Residential (MDR)

Medium density residential accommodates somewhat higher residential densities ranging from 6 to 12 dwelling units per net acre. Uses in this classification include higher density townhome developments and apartments, all with full public utility service.

High Density Residential (HDR)

Areas designated as high density residential are intended to accommodate multi-family housing at densities exceeding 12 units per net acre. Uses in this category will be principally limited to higher density apartment or condominium buildings for either general occupancy or for specific segments of the population such as senior housing.

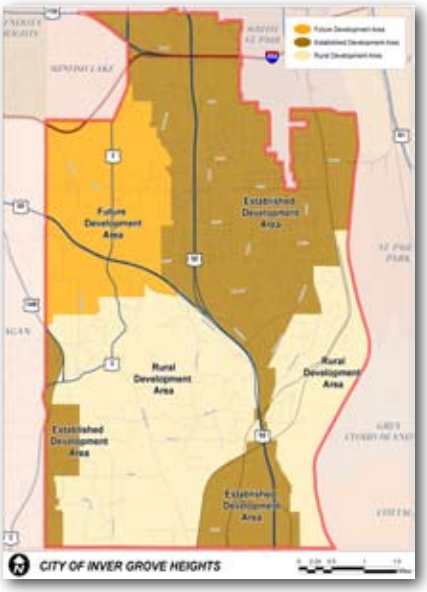


Figure 2.3: Development Policy Areas

Residential Policies

Based on the characteristics of the existing development pattern and varying policy implications, the residential land use categories can be characterized within three general development policy areas: 1) the rural development area, 2) the established development area, and 3) the future development area. The rural development area occupies most of the southern portion of the City, the established development area is generally in the northeast and the future development area is primarily in the northwestern area of the community (see Figure 2.3)

Rural Development Area Policies

1. Maintain the rural character of established neighborhoods.
2. Accommodate infill development that is consistent with existing development patterns and sizes.
3. Allow development with private, on-site utility systems. The city does not plan to extend water or sanitary sewer into rural development areas except in cases of environmental problems with existing on-site systems.
4. Create a quality living environment that is adapted to the natural environment.
5. Encourage and promote the unique lifestyle and housing opportunities that harmonize with the area's natural features and amenities.
6. Provide necessary municipal services (i.e. police, emergency response, garbage, recycling, etc...) to the estate area while recognizing that the type and level of services may differ from those provided to the urban area of the city.

Rural Areas

Rural development areas are not intended to have city sewer and water. Policy directions focus on preservation, maintenance and infill development.

7. Where possible and appropriate, encourage design patterns that integrate quality environmental resources such as wetlands or mature woods.
8. Discourage non-residential and/or non-local traffic on local streets.
9. Limit housing to single-family, detached homes capable of being supported by on-site utility systems.
10. Encourage the placement of housing units in a manner that preserves significant natural resources.
11. Prohibit commercial or industrial uses in residential areas including home occupations that involve exterior storage such as contracting businesses.
12. Continue to enforce periodic inspection requirements for on-site sewage treatment systems to ensure compliance with State and County environmental regulations.
13. Provide new development that has at least two individual sewage treatment system sites on each lot.
14. Acceptable uses within the rural development area shall include commercial agriculture pursuits but not animal feed lots, stockyards or animal slaughtering facilities.
15. The resubdivision of individual lots within existing neighborhoods shall maintain a minimum lot size of that neighborhood.
16. The design of future rural residential developments shall consider the lot sizes of adjacent developments.

Role of Agriculture in the Rural Development Area

Agriculture is one of the elements of the heritage of Inver Grove Heights. Because of past land subdivision activities and the construction of single-family homes, large-scale farming operations no longer exist. However, significant land areas continue to be used for the production of row crops and as pastureland for animals. Scattered small-scale truck farming operations also occur throughout portions of the community.

Since agriculture is a character element of the community and a means of preserving "open space", the comprehensive plan seeks to include agriculture as an interim and permanent land use depending on the desires of property owners. Individuals that choose to maintain their land in agricultural production can continue to do so and will be consistent with both the comprehensive plan and current zoning practices. Long-term agriculture outside of the area designated as Rural Development Area is not anticipated in this plan.

Established Areas

Established areas represent portions of the community which are mostly built out. Policy directions focus on preservation and maintenance of existing neighborhoods.

Established Development Area Policies

1. Allow infill development in a manner that protects the character of existing residential neighborhoods.
2. Maintain a circulation system that connects neighborhood areas while emphasizing a system of collector roadways to accommodate vehicular movements.
3. Provide a broad range of housing opportunities.
4. Insure that new development areas are compatible in size and scale with existing, adjacent neighborhoods.
5. Provide appropriate buffers to allow density transitions and to accommodate a range of housing types.
6. Promote programs and adopt and enforce codes that encourage the maintenance of the existing housing stock.
7. Encourage rehabilitation of deteriorating housing stock.
8. Conduct long term planning to ensure existing neighborhood infrastructure is well maintained and reliable.
9. Disperse affordable housing throughout the area rather than creating concentrations in specific locations.
10. Reflect the history and character of existing residential neighborhoods in future infill development within those neighborhoods.
11. Provide commercial services that are convenient to neighborhood areas.
12. Work closely with the school districts within the City to ensure that local school facilities are properly maintained, sustainable and serve as gathering spaces for neighborhoods.

Future Development Areas

Future development areas consist of areas that are largely undeveloped and planned for the extension of city infrastructure

Future Development Area Policies

1. Create planned neighborhoods with common facilities and amenities that establish a sense of identity and that helps promote long-term maintenance and value stability.
2. Create a quality living environment that is adapted to the natural environment.
3. Establish a collector road system that deters the use of local streets for non-local vehicular trips.
4. Encourage diverse housing styles consistent with the inherent characteristics of the site.
5. Encourage developments that incorporate natural features as integral elements of the residential environment.
6. Require that future street alignments fit the contours of the natural landscape.

7. Encourage cluster development practices that preserve significant natural resources by concentrating building locations.
8. Utilize natural features as connecting links between and through neighborhood areas.
9. Encourage on-site retention of storm water in open space areas without negatively impacting natural areas and without creating negative impacts on the overall visual aesthetics of the area.
10. Provide infrastructure including but not limited to water, sanitary sewer, storm sewer and streets in a phased manner, consistent with the overall development plan for the area.
11. Mandate construction practices that mitigate the impact of airport noise in the area.
12. Provide commercial areas that are convenient to residential neighborhoods.
13. Encourage creative land planning to create neighborhood areas that have a unique personality reflecting the natural beauty of the area as well as the overall context of the community.

Employment Generating Land Uses

Land uses that principally generate employment (but also provide services) in Inver Grove Heights include a number of land use categories. These uses include the following classifications: office (O), neighborhood commercial (NC), community commercial (CC), regional commercial (RC) mixed use (MU), industrial office park (IOP), light industrial (LI) and General Industrial (GI). The following is a review of each classification:

Office (O)

The office land use category includes lots or parcels that contain professional offices and services such as medical, law, real estate and financial businesses. In the land use plan, offices are concentrated in three principal locations, 1) along the Lafayette freeway in the northern portion of the community, 2) in the southern portion of the Arbor Pointe development and 3) in the northwest corner of the community at the intersection of Argenta Trail and Interstate 494 (See Figure 2.4: Office Uses). Two of these locations need additional explanation.

The area designated office along the east side of the Lafayette freeway, south of Upper 55th Street and north of 65th Street East contains a large parcel of property currently owned by the City of Inver Grove Heights. The current plan seeks to attract a corporate headquarters type of office user to this site.

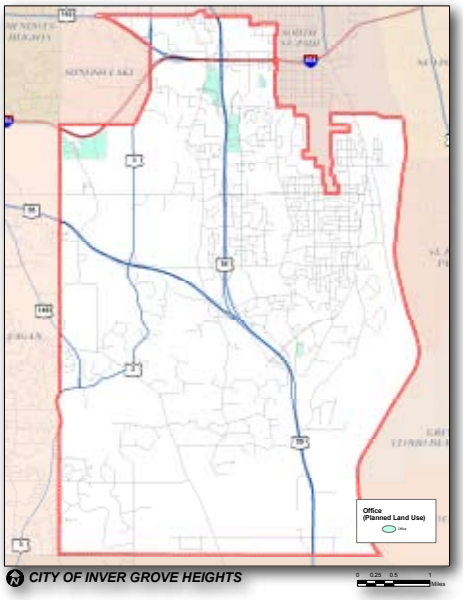


Figure 2.4: Office Uses

The prominence of the property along a major gateway to the community in addition to its access to the adjacent freeway are elements that support the office designation of this property. A vacant parcel currently owned by MnDOT is also guided for office development further contributing to the size of a parcel potentially available for development. The scale of the property, site amenities and access could support a campus-type of commercial development possibly including a medical complex.

The second office site that needs additional elaboration is the land located at Argenta Trail and Interstate 494. Past Comprehensive Plans called for office uses in this area and the current plan update concurs with this designation. Developing office uses in this area is contingent upon a future interchange at I-494. Development of an interchange to provide direct access to this portion of the City faces physical and political obstacles. Extensive wetlands and topographical features in the area complicate the location and design of the intersections. Obtaining local and regional support for an interchange may also pose a number of challenges; however, recent planning efforts conducted by Dakota County in partnership with local municipalities reinforces the need for an interchange due to regional traffic demand and has indicated strong local support. Last but not least, identifying funding for the interchange will also be a challenge. The City intends to pursue the interchange and thus is maintaining an office land use pattern in its Comprehensive Plan. If the interchange in this area proves to be unworkable, it is likely that the office property will be developed as low or medium density residential development. The area may be able to support medium or even higher density residential development if an appropriate east/west arterial or major collector roadway is developed with an eastward connection to South Robert Trail.

See north south corridor study completed by Dakota County in 2007

Office Development Policies

1. Create new and reserve existing areas for office development to provide employment opportunities in the community and signature land uses. In some cases, the designation of property as office may prolong the absorption rate compared to other possible land use designations.
2. Insure that large office areas have adequate access to major arterial roadways to prevent impacts on the local residential street network.
3. Encourage the inclusion of natural amenities such as ponds and wetlands into office campus environments.
4. Encourage relationships between existing and future large-scale office users and the local and community college school systems to strengthen the bind between the public and private sectors in Inver Grove Heights.
5. Connect concentrated office areas to residential neighborhoods via

a pedestrian trail network to encourage alternative transportation methods.

6. Encourage site design principles that support transit useage.

Neighborhood Commercial (NC)

Neighborhood commercial areas include lots or parcels containing retail sales and services located along collector roadways that serve the adjacent neighborhood area (see Figure 2.5: Commercial Uses). The neighborhood commercial designation is the least intensive of the commercial classifications used in the comprehensive plan. Neighborhood commercial areas are intended to house businesses that provide convenience goods and services. Convenience goods and services include items that are regularly needed by nearby residents such as small grocery items, dry cleaning, video rentals, etc. Properties designated as neighborhood commercial on the land use plan are located along "A" minor arterials or community collector roadways.

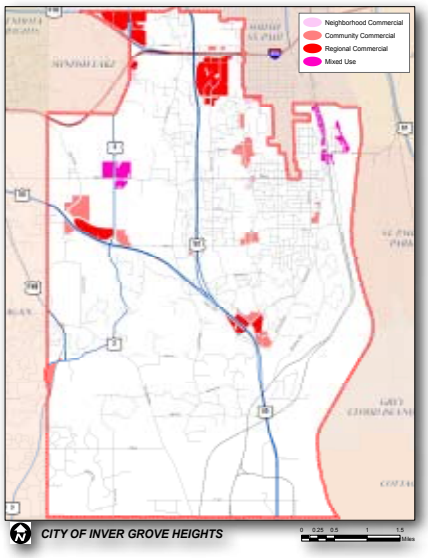


Figure 2.5: Commercial Uses

Neighborhood Commercial Area Policies

1. Provide neighborhood commercial areas to supply convenience goods and services principally for residents of Inver Grove Heights.
2. Require appropriate land use transitions at the edges of residential neighborhoods through the use of setbacks, screening, buffering and fencing.
3. Enforce land use controls to limit the scale of commercial development in neighborhood areas.
4. Place strict limitations on lighting, vehicular access and other site planning elements in order to alleviate conflicts with abutting residential uses.
5. Require sidewalk connections along major streets leading up to neighborhood commercial centers and direct connections from the public sidewalk to the storefronts.

An appropriate scale of neighborhood commercial areas includes buildings that are one or two stories with footprints generally less than 40,000 square feet. Total area (critical mass) commercial space should generally not exceed 100,000 square feet.

Community Commercial (CC)

Community commercial areas include lots or parcels that contain retail sales and services located along community collector and arterial roadways that serve the community (see Figure 2.5: Commercial Uses). Community commercial areas differ from neighborhood commercial areas in that they are more intensive and are designed to attract customers from a wider trade area. As such, the goods and services that are available in community commercial areas are broader in scope such as restaurants, private recreational facilities, professional service offices, small-scale printing, etc.

Prominent Community Commercial nodes are located along Cahill Avenue. A Corridor Master Plan for Cahill Avenue was prepared and adopted by the City in 1996. The plan, which was a joint effort of the City and the Inver Grove Heights-South St. Paul Chamber of Commerce, identified a series of physical improvements along the corridor. Implementation of the plan began in 1997 and resulted in improvements that have facilitated commercial development.

Community Commercial areas are intended to accommodate a critical mass of 100,000 to 250,000 square feet of space. The uses should be configured within a series of buildings that are well connected and encourage pedestrian circulation within the district as well as encouraging trail and sidewalk connections to adjacent neighborhoods.

Community Commercial Area Policies

1. Provide goods and services that are needed by Inver Grove Heights residents in environments that serve as identifiable community shopping nodes.
2. Ensure pedestrian connectivity via trails and sidewalks within community commercial districts as well as to adjacent and nearby neighborhoods.
3. Encourage private sector redevelopment efforts and rehabilitation of existing buildings.
4. Encourage convenient parking in locations that are buffered with landscaping to soften their appearance from abutting roadways.
5. Encourage a stronger linkage between the northern and southern Cahill community commercial areas through coordinated streetscaping efforts.
6. Provide safe and convenient pedestrian accesses within and connecting to community commercial areas and adjacent neighborhoods.
7. Carefully regulate uses that have the potential to create adverse secondary land use impacts such as adult uses, pawn shops, etc.

Regional Commercial (RC)

Regional commercial areas are lots or parcels containing large-scale retail sales and services along arterial roadways that serve the region (see Figure 2.5: Commercial Uses). As the name implies, goods and services offered in such areas appeal to a wide range of consumers, many of whom are willing to travel a significant distance to patronize various business establishments. Regional Commercial districts are intended for large "big box" users. These types of uses serve as anchors for other small to mid-sized commercial uses that benefit by the traffic generated by the anchors.

Regional Commercial areas range in size from 20 to 40 acres. Typical patterns of development include a series of stores or shops with one or more "big box" stores as anchors. A critical mass of commercial square feet would typically exceed 250,000 square feet.

Inver Grove Heights has a number of areas located along major arterial roadways guided for regional commercial uses. An area on the north side of Interstate 494 and Highway 110 is currently developed. The developing area is in a parcel that is generally known as the southeast quadrant. Located in an area bounded by Interstate 494, the Lafayette Freeway and Upper 55th Street, this site has excellent exposure to regional transportation facilities. Despite this fact, development of the property did not begin until 1996 when construction began on a movie theater complex and associated commercial uses. The theaters served as a catalyst and the area has since undergone significant development.

Part of the Arbor Pointe development in southern Inver Grove Heights has recently seen development of a Super Walmart as well as a number of adjacent retail services. The development of commercial space at Arbor Pointe is well underway.

A new developing area of regional commercial uses is located in the Northwest Area along the north side of Highway 55 between Argenta Trail and South Robert Street. This area is conveniently accessible to major highways and will serve future residential development within the Northwest Area.

Regional Commercial Area Policies

1. Provide regional commercial areas to supply goods and services that appeal to a broad base of customers.
2. Ensure a design pattern that facilitates pedestrian circulation between uses within the district and establishes a level of amenities that enhances the sustainability of the center.
3. Encourage public and private improvements that create attractive environments for regional commercial developments.
4. Unify major roadway corridors with appropriate design guidelines and consistent landscaping and signage improvements.
5. Require landscaping and site design details to help break up large parking lot areas and to make developments more attractive both internally and when viewed from adjacent roadway corridors.
6. Require high quality building materials for structures in regional commercial areas.
7. Provide arterial and community collector roadways necessary to support regional commercial developments.
8. Carefully regulate uses that have the potential to create adverse secondary land use impacts such as adult uses, pawn shops, etc.
9. Consider long term strategies for future reuse/reconfiguration of regional commercial centers during the initial planning stages.
10. Encourage a mix of commercial uses within regional centers that share varying peak period traffic and parking patterns to help manage traffic congestion and allow for shared parking opportunities.
11. Encourage site design that supports transit useage for employees and potential shoppers.

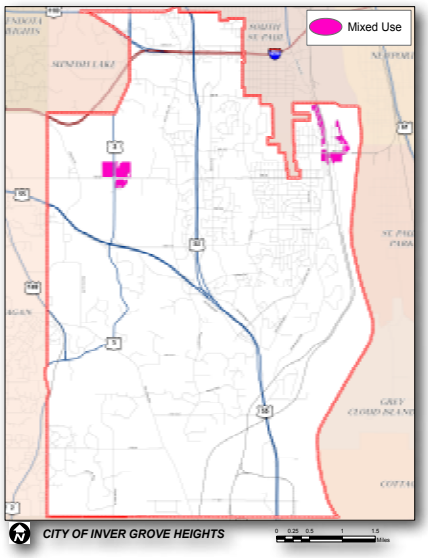


Figure 2.6: Mixed Uses

Mixed Use (MU)

Mixed use areas consist of lots or parcels that contain a mix of retail and service commercial, office, institutional, higher density residential, public uses and/or park and recreation uses, organized in a pedestrian friendly environment (see Figure 2.6: Mixed Uses).

Robert Street and 70th Street West: The Comprehensive Plan designates the area at the intersection of South Robert Trail and 70th Street West as mixed use. The vision for this area is to establish a neighborhood hub that integrates higher density residential uses with neighborhood commercial services. In recent years, there has been an increased interest in creating development patterns that capture historic urban qualities and land use relationships. This movement was originally known as "new urbanism" and is now generally known as "traditional neighborhood design" or TND. The mixed use area in Inver Grove Heights has the potential to be developed utilizing some of these design principles. The development pattern is expected to have a pedestrian orientation rather than a sole focus on vehicular movement. The opportunity exists to integrate a variety of land uses making neighborhood commercial areas truly accessible to the surrounding residential neighborhood both due to the close proximity of the uses and a pedestrian sidewalk or trail system that provides direct linkages. Also of long term consideration is the notion of "Transit Oriented Development" or TOD, which encourages mixed use as a means of supporting transit service because of its ability to generate transit users who both arrive and depart from a particular node (see inset TOD.) Developed in this manner, the mixed use area in Inver Grove Heights has the potential to become an attractive amenity for both the northwest area and the community as a whole.

Concord Boulevard: Another area of mixed use is the Concord Boulevard Corridor (generally north of 70th Street.). The idea for mixed use along the Concord Boulevard Corridor is to encourage or facilitate redevelopment and reinvestment along the corridor in a way that helps traffic flow by controlling access, encourages an attractive street frontage as a gateway corridor to the City and allows flexibility in the use of lands along the corridor as business or residential uses. This pattern of use current exists along the corridor. A redevelopment plan was prepared for the Concord Boulevard area, which was adopted by the City in 1998. The plan addressed a number of issues including:

- Land use patterns
- The role of the Mississippi River levee
- Housing

Mixed Use Assumptions

In order to establish development projections, mixed use areas are assumed to be approximately 2/3 residential and 1/3 commercial. Residential density would be at a minimum of 12 units per acre in mixed use areas.

Transit Oriented Development

A combination of changing demographics that are drawing people back to the City, new technologies in transit systems, increasing gridlock on our roads, rising (and instability of) gas and oil prices and diminishing state funding for roadway improvements is pushing communities to explore alternatives for how people move within their cities and throughout the region. Being located along a future possible transitway corridor (the Robert Street Corridor) Inver Grove Heights is uniquely positioned to embrace the possibility of Transit Oriented Development (TOD). The Robert Street Corridor includes the possibility of transit stops within the City of Inver Grove Heights. Additionally, the Metropolitan Council has identified southern Inver Grove Heights as a potential location for a park and ride facility.

Benefits of Transit Oriented Development to the City of Inver Grove Heights

Regardless of the transit facility (i.e. a fixed system like Light Rail Transit-LRT, Commuter Rail-CR or Bus Rapid Transit-BRT) regular route bus service or express bus with a park and ride facility, Inver Grove Heights has an opportunity to begin positioning future transit stations as transit oriented developments of varying configurations. Supporting a strong policy of Transit Oriented Development offers several benefits to the City of Inver Grove Heights:

1. Transit Oriented Development supports increased ridership which supports a stronger, less subsidized transit system.

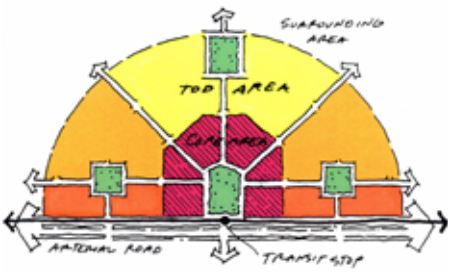
2. Studies have shown that fixed transitway systems can increase property values which in turn can facilitate redevelopment of underutilized sites or development of infill sites.

3. Higher density housing opportunities around transit stops provide opportunities for more sustainable life styles that are less dependent on the automobile.

4. The same higher density housing opportunities can offer more affordable housing choices, helping the City of Inver Grove Heights achieve regional housing and affordability goals.

Eagan Transit Center with retail development adjacent a park and ride lot. Retail parking demands generally have opposite peak demand than commuter parking and therefor creates opportunities for shared parking.

A project in Redmond, WA used TOD as an opportunity to achieve more affordable housing by combining transit services, park and ride and housing within the development project. The development also used sustainable stormwater management practices.



Transit Oriented Development (TOD) concept illustration from Calthorpe Associates.

5. Transit Oriented Development patterns are of a higher intensity and can generate greater tax revenues while requiring the same or lesser infrastructure systems than traditional suburban development patterns.

6. A transit corridor connecting Inver Grove Heights to other planned fixed transitways in the Metro area provides a connection to a regional labor force and offers excellent corporate business sites in Inver Grove Heights.

7. A successful fixed transit system connecting Inver Grove Heights with the downtowns of St. Paul and Minneapolis and other regional job centers offers Inver Grove Heights residents an alternative transportation choice, reducing the stresses of fighting traffic, lowering commuter costs and enhancing quality of life.

TOD Defined

Transit oriented development is generally described as a development pattern extending roughly ¼ to ½ mile radius around a transit station with the following characteristics:

- Connected streets and sidewalks that lead to the transit station
- Residential densities generally greater than 10 units per acre
- Employment densities of 50 to 75 employees per acre (.4 to .6 Floor Area Ratio)
- Vertical development patterns
- High level of pedestrian amenities (attractive streetscape, public art, pocket parks/plazas, street furniture)
- Human scale architecture
- Structure parking or shared parking
- A mix of uses

Principles of Transit Oriented Development

The Urban Land Institute (ULI) has published a document titled "Ten Principles for Successful Development Around Transit." These principles offer guidance to Inver Grove Heights in posturing potential development patterns around future transit stations. The following principles are adapted from the ULI publication:

1. Make It Better with a Vision—Creating a flexible, realistic

vision and focusing on its implementation. Inver Grove Heights has two separate but connected opportunities to enhance and embrace the amenities of transit systems: the fixed transit corridor concept envisioned for the Robert Street Corridor and the regular local bus systems. Inver Grove Heights has an opportunity to embrace transit systems and establish a vision that promotes TOD along both systems particularly around park and ride structures.

2. Apply the Power of Partnership—Forming public/private partnerships to develop strategies and implement change. Dakota County and the region have a number of agencies and developers who when partner together can realize dual goals and objectives such as profitability, affordable housing, infrastructure enhancements and brownfield clean up.

3. Think Development When Thinking about Transit—Planning for development when planning for transit. Major development projects will occur ahead of any fixed transit system. The development patterns within the Northwest Area should be planned with transit service in mind. Future park and rides in Inver Grove Heights should be seen as an asset and potential revenue generator and not simply a surface parking lot for commuters.

4. Get the Parking Right—Determining the optimal number of parking spaces to support the transit station and surrounding development. Parking is a challenge for a number of reasons and not just for transit stations. Too much parking adds unnecessary hard surfaces that have negative environmental impacts and decreases the pedestrian friendliness of the area. Too little parking creates negative economic perceptions and can result in transit users spilling into adjacent neighborhoods or taking up needed retail parking areas. The challenge with parking is achieving just the right amount of parking. Creative strategies for sharing parking with users that have varying peak parking needs and providing alternative mobility options can be applied, particularly in the Northwest Area.

5. Build a Place, Not a Project—Turning a transit station into a great place that attracts the community and businesses. Public amenities, pocket parks, urban plazas, attractive streetscapes, art, wayfinding signage, unique architecture all contribute to the success of a TOD.

Parking must be carefully balanced to meet the needs of transit and the use on the site.

Thought must go into the siting of the transit station, rather than isolating it away from logical attractions and amenities.

Creative design approaches allowed this development project to incorporate two major retailers and transit parking on a former site that was just used for transit parking. The development provides jobs, tax base and retail services in Seattle, WA.

Careful thought must be given to the entire TOD and not just a single project within, near or adjacent the transit station.

6. Make Retail Development Market Driven, Not Transit Driven—Getting the right mix of retail development. Transit systems can enhance or support retail development projects, but by themselves will not drive a retail area or development. TOD can help strengthen and re-brand the retail development within Inver Grove Heights. The Northwest Area presents an opportunity for a retail focused TOD.

7. Mix Uses, but Not Necessarily in the Same Place—Including a variety of mixed-use projects along a transit line. Stations along the Robert Street Corridor or other transit facilities in Inver Grove Heights lend themselves to mixed-use development projects; however, each station tends to present unique opportunities for a particular focused land use patterns.

8. Make Buses a Great Idea—Making bus travel more appealing. Transit faces its greatest challenge in competing with the luxury of the automobile. In order to make transit more competitive, riding the bus needs to be almost fun!

9. Encourage Every Price Point to Live around Transit—Encouraging an assortment of price points. Land costs around transit stations tend to rise as TOD gains momentum. Diversity of the populations that live within TOD projects is an important part of contributing to a sense of place. Inver Grove Heights would be well served to establish a high level of public amenities that attract upper end price points, while encouraging a higher density of development that enables developers to offer more affordable housing choices.

10. Engage Corporate Attention—Engaging the corporate community in understanding how its locational decisions affect the whole transportation system, as well as its employees' transportation choices. Inver Grove Heights is uniquely located close to an international airport, and a fixed transit system will ultimately connect to downtown Minneapolis via the Central Corridor, further making an international and national corporate connection.

- Businesses
- The river bridge
- Public recreation

The plan includes a set of detailed policies to direct future redevelopment efforts. The land use recommendations from the adopted Concord Boulevard Redevelopment Plan were directly incorporated into the Future Land Use Plan of the Inver Grove Heights Comprehensive Plan. This plan will continue to serve as a policy guide.

As Concord Boulevard improvements are implemented over the next few years, redevelopment proposals will likely be brought forward by property owners and developers interested in the corridor. The guiding principles for the Concord Boulevard Corridor are as follows:

1. Direct access to the corridor should be reduced and limited over time. Access should be via side streets, alleyways and in limited cases directly via shared drives.
2. Future development in the corridor may be either vertically mixed uses (i.e. residential or office over retail) or horizontally mixed uses. Redevelopment of individual parcels should be designed as part of a master planned area to avoid conflicts with existing adjacent landuses.
3. Commercial or business uses should be located around key intersections at 66th and 63rd Street and should be designed to utilize on street parking on side streets (not on Concord Boulevard) and shared off-street parking.
4. Commercial or office uses located along the corridor between key intersections should be designed to blend in with residential building characteristics and not require significant off street parking.
5. Residential uses occurring along the corridor should have porches that front on Concord Boulevard with yards that provide separation between the street and the residential structure.
6. Sidewalks should separate residential uses from the street and provide connectivity to area amenities and attractions such as Heritage Park and the Mississippi River.
7. Higher density residential uses should be supported not only as a means to redevelopment but as a means of intensifying the corridor to support commercial uses, provide a labor force and take advantage of public improvements such as Heritage Park.
8. Design features should consider building height in relationship to the bluff area and the Mississippi River.

A concept for Concord Boulevard explores the idea of mixed use along the corridor with commercial focused at key nodes. This concept takes advantage of the improvements with Heritage Park and the potential connections to the Mississippi River.

Redevelopment of the Concord Boulevard corridor is an important future improvement that will support the significant investment in Heritage Park and reconstruction of Concord Boulevard and provide an important critical mass that helps sustain commercial development in Inver Grove Heights. Future redevelopment will also take advantage of the Mississippi River Regional Trail Corridor connecting Inver Grove Heights with regional destinations.

Mixed Use Area Policies

1. Provide a unique mix of commercial, residential, public and related uses in a pedestrian friendly environment.
2. Provide a flexible land use tool that supports redevelopment while minimizing the creation of non-conforming uses.
3. Enact zoning modifications necessary to facilitate a mixed use development pattern that includes small, neighborhood scale structures and design features.
4. Provide walkway and trail linkages to other public recreational facilities in the area.
5. Encourage consistent design standards that serve as a framework for both public and private improvements addressing streets, lighting, landscaping, building materials and building placements.
6. Limit commercial uses to those that provide neighborhood and convenience goods and services.

Industrial Office Park (IOP)

Industrial office park includes lots or parcels containing warehousing, storage and light industrial uses with associated office functions (see Figure 2.7: Industrial Uses). Industrial office park developments are usually designed in a unified manner and feature landscaped open areas and roadway edges, consistent lighting, and entry monumentation. The future land use plan identifies a number of IOP parcels along Highway 55 and 55/52.

Industrial Office Park Area Policies

1. Provide opportunities for new industrial development and expanded employment opportunities in Inver Grove Heights.
2. Provide attractive, planned environments as means to induce employers to locate within the City.
3. Enact standards for industrial developments that are in keeping with the need to improve the appearance and character of industrial properties.
4. Provide public services and infrastructure in keeping with the needs of

employers.

5. Require that all storage be enclosed within buildings or screened from view from roadways.
6. Adopt design guidelines addressing signage, landscaping, lighting, exterior building materials and other site improvements.
7. Encourage design and development techniques that seek to minimize storm water runoff and other environmental impacts.
8. Encourage uses that are building and employment intensive as opposed to land intensive uses such as truck parking and outdoor storage.

Light Industrial (LI)

Light industrial areas in Inver Grove Heights include lots or parcels containing light manufacturing, goods movement and wholesale trade. Light industrial parcels are located in a number of sites throughout the community with concentrations in the northeast and extreme southern portions of the city (see Figure 2.7: Industrial Uses).

General Industrial (GI)

The general industrial category includes lots or parcels containing manufacturing, processing and disposal facilities. General industrial parcels exist in only one area, southern Inver Grove Heights lying immediately west of Highway 52/55 (see Figure 2.7: Industrial Uses). The land designated as general industrial on the future land use plan includes the Pine Bend Landfill.

Light industrial and general industrial are similar uses with the predominate differences being in the intensity of the types of uses and the nature of the uses themselves. General industrial is analogous to "heavy" industrial users such as the landfill operation. In southern Inver Grove Heights, areas containing both of these uses are intended to be improved and upgraded over time. Industrial development in the southern part of the City has been occurring for the past 40 years. Recent public improvements and comprehensive plan amendments have enabled the extension of public infrastructure to serve much of this area. In the future, if it becomes feasible to extend infrastructure to more of this area, the City anticipates potential redevelopment.

Because of the similarities between the light industrial and general industrial land use categories, policies are combined for both uses.

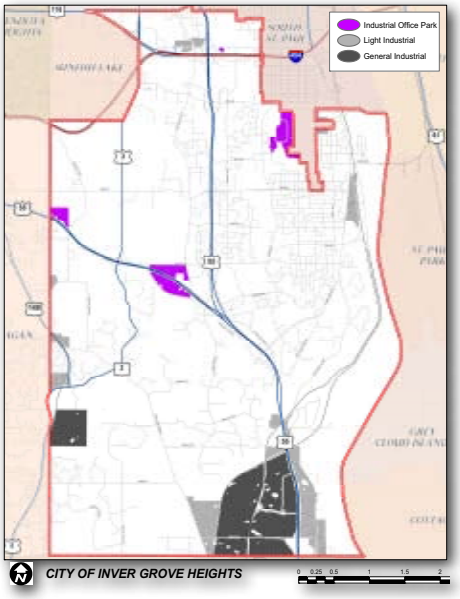


Figure 2.7: Industrial Land Uses

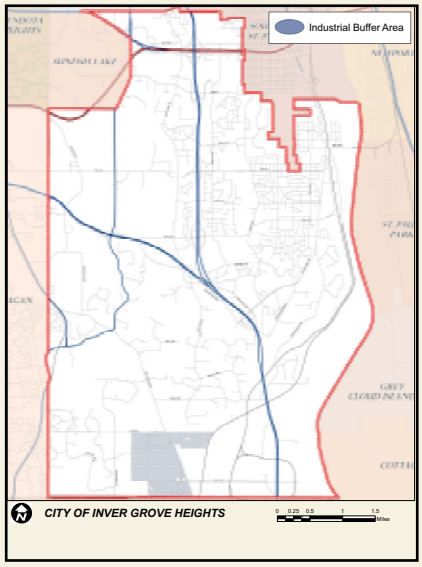


Figure 2.8: Industrial Open Space

This is a new land use category that is intended to preserve lands adjacent to more heavy industrial areas in southern Inver Grove Heights as open space, while enabling existing industrial related uses to continue to operate under current conditional use permits.

Light Industrial and General Industrial Policies

1. Provide opportunities for new industrial development, expansion of existing uses and the redevelopment of existing industrial uses to expand employment opportunities and to serve existing businesses in the community.
2. Improve the appearance of existing industrial areas and minimize adverse impacts on the community's image and development potential.
3. Ensure adequate public facilities and infrastructure systems to serve future development and redevelopment of the area.
4. Improve existing industrial areas over time using redevelopment tools and possibly financial incentives, particularly in areas that are highly visible from adjacent roadways.
5. Enact standards for new industrial developments that are in keeping with the need to improve the overall appearance of the community.
6. Require landscaped buffers between dissimilar land uses to enhance compatibility.

Industrial Open Space

The Industrial Open Space category includes lands that are intended to serve as a buffer between heavier industrial uses (land fill, gravel pit and refinery) and rural residential uses. This area generally reflects a 1 - 1.5 mile radius around the refinery and land fill facilities (see Figure 2.8: Industrial Open Space). Some industries have actually acquired lands within this area with the intention of gradually eliminating residential uses that pose a potential conflict. The IOS land use category guides the area as passive open space which may include agricultural/horticultural uses, limited trails and passive open space areas. Industrial uses that are currently operating within this area would be allowed to continue operating under existing conditional use permits without further restrictions. Likewise, existing residential uses would be permitted to continue as an allowable use. A greenbelt located on the outer edges of the area would serve to preserve existing natural resources and guide the restoration of native vegetation. New development that is not directly related to open space uses or an existing conditional use permit would requrie a change in the Comprehenisve Plan designation.

Industrial Open Space Policies

1. Prohibit development in the Industrial Open Space area that would conflict with heavy industrial uses east of Rich Valley drive.
2. Allow/encourage uses that reflect passive open space such as agriculture, horticulture, natural resource preservation or trail development.

3. Encourage the maintenance and management of vacant lands as natural areas including the restoration of native vegation.
4. Manage existing industrial uses within the IOS area through the conditional use permit process.

Public/Institutional Uses

Public/Institutional uses in Inver Grove Heights include churches, buildings and land adjacent to schools, cemeteries, government facilities and other parcels that are owned by a public agency or institution. The public/institutional category does not include parks and recreation areas. They are classified separately under this plan.

The most prominent public/institutional land uses in Inver Grove Heights include schools and local government facilities. Schools include facilities owned and run by the three public school districts that lie within the community and Inver Hills Community College. Local government facilities include the city hall, community center and public works complex and the fire station locations.

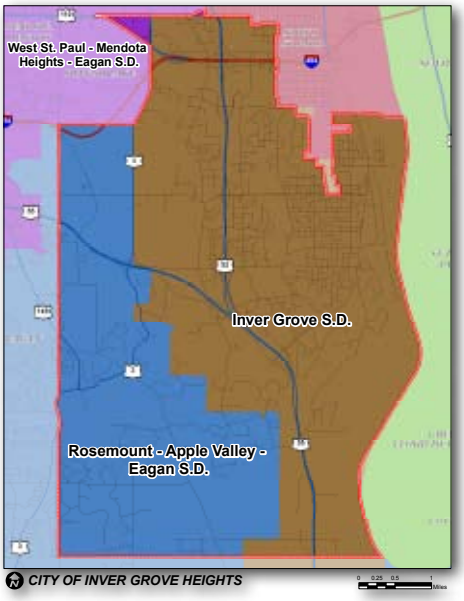


Figure 2.9: School District Boundaries

Public/Institutional Use Policies

1. Provide needed public facilities and services for existing and future Inver Grove Heights residents.
2. Interconnect the City's most important public facilities including schools and churches via open space corridors.
3. Continue to cooperate with the local school districts and Inver Hills Community College for the joint use of facilities.
4. Provide sufficient land to meet the public/institutional service needs of the community.
5. Continue to cooperate with Dakota County to provide library services in the community.

Public Park and Open Space

Public park and open space includes the City's Park system as well as areas of public ownership that are intended for open space use (see Figure 5.10: Park & Open Space). Typically, these areas include lands used for stormwater storage or other public infrastructure need and are not considered developable.

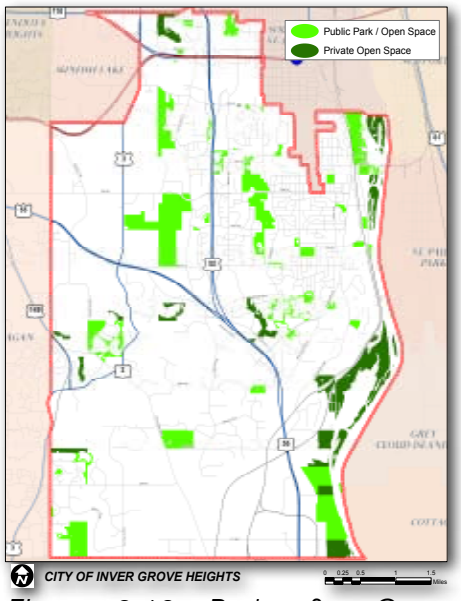


Figure 2.10: Parks & Open Space

Public Park and Open Space Policies

1. Provide adequate lands to accommodate future park needs consistent with the Park Plan.

"Achieving a balance of jobs to housing moves Inver Grove Heights forward in being a "healthy community."

2. Ensure sufficient lands set aside to manage storm water runoff and other infrastructure needs.

Private Recreation/Open Space

Private Recreation/open space is a land use category that identifies private land areas which are used for recreational purposes and have the appearance of open lands (i.e. golf course, gun clubs, nature areas, or common open space.) The intent of the comprehensive plan is to guide these uses as they are known today to ensure a public process for future re-guiding should the development intentions of such property change.

Private Recreation/Open Space Policies

1. Ensure areas used for private recreation and open space areas are able to continue operating under current conditions.
2. Ensure future redevelopment of private recreation and open space areas is conducted through an informed and transparent public planning process.

Future Growth Phasing

In 2000, Inver Grove Heights had an estimated population of 29,751. Current residents were attracted to the community for a number of reasons including proximity to employment, an attractive natural environment, an excellent park system, a mix of housing types, good schools, etc. These same factors will continue to attract new residents to the community in the years ahead. In order to accommodate demand for community growth a number of amendments to the 1998 Comprehensive Plan have been made. These amendments were largely a result of market forces but also were based on a more detailed understanding of site conditions and constraints. Each amendment was carefully evaluated for consistency with the community's vision and guiding principles. Consistent with the future land use plan, growth will be largely accommodated in the northwest area of the City.

Figure 2.12 and Table 2.3 identifies vacant, developable lands within the City of Inver Grove Heights. With the exception of Rural Residential and the Industrial Buffer Area lands, all lands are intended to receive municipal sewer and water services.

A key consideration in our planning process is seeking a balance of jobs and housing in our community. This balance is both in terms of the number of jobs relative to the number of households, as well as the type of job relative to our land use patterns (see table 2.5). This balance will be discussed further in the housing chapter. The benefits of achieving a balance of jobs to households are many, but most importantly, having jobs close to housing reduces vehicle miles traveled to work which in turn reduces transportation costs and time spent in traffic. This is an important aspect of being a sustainable community and a healthy community.

Based on 2000 Census data, IGH had a ratio of 0.73 jobs for every household. (see table 2.4) The majority of these jobs were industrial or commercial (retail or service) jobs based on the existing land use supply. Research suggests that a targeted standard for jobs-housing ratio is approximately 1.5 (Source: Jobs-Housing Balance: APA Planning Advisory Service Report Number 516 published in 2003). This ratio is based on the assumption that the average number of workers per household is 1.5. However, in metropolitan areas where jobs are more regionally allocated, such as Inver Grove Heights, that target may be closer to 1. Eagan's 2000 ratio was 1.9 jobs per household.

Figure 2.12: Vacant Land Areas

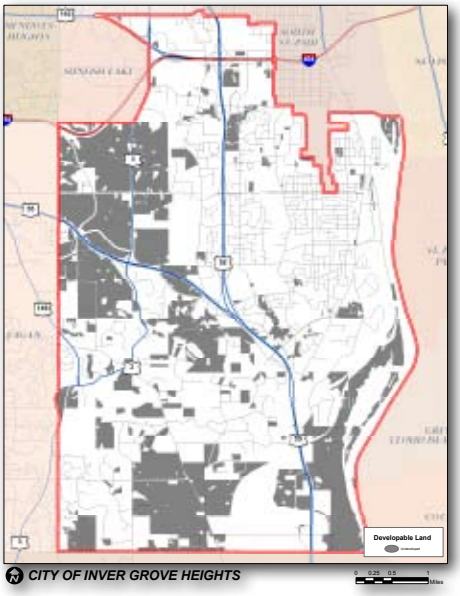


Table 2.3: Total Developable Acres

(Note: This table represents a full build out based on the 2030 Land Use Designations.)

Future Land Use (2030)	Total Acres
Rural Residential	739
Low Density Residential	632
Low-Mid Density Residential	537
Medium Density Residential	286
High Density Residential	21
Mixed Use (Residential)	47
Neighborhood Commercial	5
Community Commercial	131
Regional Commercial	99
Mixed Use (Commercial)	23
Light Industrial	216
General Industrial	137
Office	154
Industrial/Office Park	118
Public Institutional	40
TOTAL:	3,185

Using sound planning assumptions for estimating employment, there is a possibility that Inver Grove Heights could accommodate approximately 9,700 new jobs between 2000 and 2030. Achieving this number depends on a stable economic climate, and development of future transportation improvements which will require a change to the regional transportation system plan.

In Inver Grove Heights, the Metropolitan Council has provided the City with its forecasts for population, households and employment. By and large, this comprehensive plan supports these estimates. However, our plan suggests that there is a possibility of greater development that might exceed these forecasts, particularly in the area of employment. Table 2.4 reflects the population, households and employment projections for this Comprehensive Plan update.

Table 2.4: Population, Household, Employment Forecasts

Comprehensive Plan Est.	2000	2010	2020	2030		Change from 2000 to 2030
Population	29,751	33,910	40,540	47,260		17,500
Households	11,257	14,010	16,990	19,250		8,000
Jobs	8,168	12,000	14,700	17,900		9,700
Jobs/HH Ratio	0.73	0.86	0.87	0.93		

Factors influencing population, household and employment forecasts:

1) Regional growth and travel demand has demonstrated a need for future north/south transportation improvements through Inver Grove Heights. This regional growth suggests a need for an additional interchange at I-494. (See the North South Corridor Study completed by Dakota County in 2007)

2) Given Inver Grove Heights proximity within a metropolitan area (close to an international airport and two central business districts) and adjacency to major regional highway corridors, the land use patterns and intensities assumed in our projections are reasonable.

Table 2.5: Job Growth 2000-2030 by Land Use

Job Type	Est. Job Growth 2000 to 2030	% of Total Jobs
Office (Include Public/Institutional)	2,460	25%
Industrial/Office	1,410	15%
Industrial	550	6%
Commercial/Retail Services	5,280	54%
Total Potential Jobs	9,700	100%

In order to provide the rational for our estimates, we have examined future land use needs and conducted a general analysis of the existing land use supply in Inver Grove Heights. It is important to note that projecting land demand is a challenging task that is greatly influenced by market conditions and land owner interests in development; two forces which are not controllable by the City of Inver Grove Heights. However, the City's ability to guide land for development and plan for capital improvements that provide necessary urban infrastructure to development areas, plays a significant roll in achieving development projections. The following section provides greater rationale for our forecasts.

Hoisington Koegler Group Inc. is the primary source of the population, household and employment projections contained within this plan. Estimates were developed from 2007 Dakota County parcel data integrated with future land use and infrastructure data. Detailed assumptions are available as an appendix to the plan.

Future Land Demand

Based on household projections completed by both the Metropolitan Council and the City of Inver Grove Heights, land requirements for future land development can be calculated. From 2000 through 2030, Inver Grove Heights is projected to add as many as 8,000 new households. These households will be accommodated in a number of types of residential dwellings at varying densities. The actual types of units that will be built and the corresponding land that is required will be determined by the needs of the new residents and general market conditions. Projections of land demand, however, can be made based on reasonable assumptions of housing unit types and densities.

Our future land use plan provides a capacity to meet our 2030 household projections. The bulk of this capacity is serviceable with sewer and water and is anticipated to occur within the City's Northwest Area.

Our future land use plan also provides capacity for future commercial, office and industrial development. Based on reasonable planning assumptions relative to development intensity our land use plan demonstrates a total capacity to add nearly 11 million square feet of commercial (2.5 million), office (2 million) and industrial space (6.5 million). Absorption of this space will vary based on market conditions, land owner development interests and regional infrastructure improvements.

A key factor in the future development of office and industrial space is access to regional transportation systems and future interchanges at Argenta and Highway 55 and in the general proximity of Argenta Trail and I-494

Expansion of Urban Services

In the last eight to ten years the City of Inver Grove Heights has undergone a significant amount of infrastructure planning pertaining to the northwest area of the community and the industrial area south along Highway 55/52. These areas are the predominant areas of community growth over the course of the next 20 years. Other areas of the community that might begin to see infrastructure improvements include portions of the City with joint services from Eagan and areas south of Highway 55 on the west side of Inver Grove Heights. Figure 2.3 depicts the anticipated areas of service for future development with urban services. This figure is for general planning purposes and does not serve as a limiting factor for future growth.

The following assumptions were used in projecting land use absorption between 2000 and 2030:

Residential Assumptions (per net acre)

LDR--2 units per net acre
LMDR--4 units per net acre
MDR--6.5 units per net acre
HDR--12 units per net acre
Mixed Use Res.--15 units per net acre

85 to 90% absorption of remaining vacant lands guided for urban residential--enables consideration for park land needs and conservation preferences

Commercial/Office/Industrial Assumptions

Floor Area Ratio (FAR) - or the ratio of usable square feet of a building to the land area ranged from .15 to .35 with industrial uses on the higher side due to need for less parking, and commercial uses on the lower side due to the need for more parking.

Absorption of commercial/office/industrial property ranges form 65 % to 75% of remaining serviceable vacant lands.

Employment is estimated at 1 employee per 1,500 to 2,000 square feet for the bulk of serviced industrial users, and 1 employee per 330 to 500 square feet for commercial and office users.

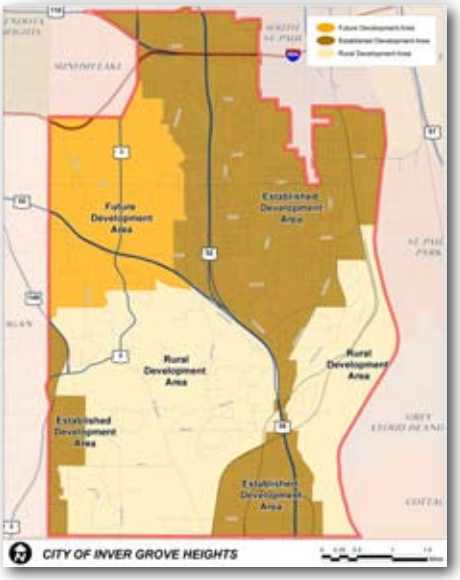


Figure 2.3: Development Policy Areas --Future Development Area represents where new development with urban services wil be a priority.

Extension of infrastructure to serve future development requires a significant amount of physical planning (how to get the infrastructure in the ground and to the area to be served) and financial planning (how do you pay for the infrastructure). A number of factors impact the ability to extend services. These factors include land ownership patterns and the desire to develop; land characteristics and the ability of the land to carry projected development; market forces/conditions and the ability of the market to sustain the necessary and projected development type; and regional infrastructure improvements that require actions from multiple jurisdictions in order to proceed.

The City of Inver Grove Heights approach to extending infrastructure is to maintain an open door policy and consider extension of infrastructure at the discretion of the City Council with consideration of the following factors:

- Extension of services that might facilitate expansion of the City's job base: A stated objective of the comprehensive plan is to work towards balancing jobs to households at a 1:1 ratio.
- Form of development consistent with future land use guidance: The City has guided land use for every parcel. Consistency with the land use map is important. However, changes to the land use plan should be considered and should be evaluated based on the vision, guiding principles and policy directives in the plan.
- Extension of services to areas already guided for urban development: Significant planning has been done for the Northwest Area and areas in southern Inver Grove Heights that have evaluated the physical and financial impacts of infrastructure development.
- Financial impact to the City: The City finances the extension of trunk infrastructure systems and utilizes revenues from development to help pay for such investments. Extending infrastructure through areas that do not anticipate developing in the near term pose financial challenges that must be overcome.
- Local and regional transportation impacts: A long term transportation plan has been established as part of this plan update. Future development should be evaluated as to the impact with this plan and its consistency with regional transportation investments or improvements.
- Market demand and economic conditions: The City must evaluate development within the context of current and near term market/economic conditions and manage the level of risk.

MUSA Expansion Exceptions

Four existing neighborhood areas in the northwest portion of Inver Grove Heights have unique land use characteristics that warrant special consideration in the Land Use Plan and specifically, in future utility planning (see Figure 2.13). These neighborhoods were identified in past planning efforts and are carried forward for this plan.
The neighborhoods include the following:

- Rosenberger Lake Neighborhood – The Rosenberger Lake Neighborhood which is located southeast of the intersection of South Robert Trail and Highway 55 includes 104 acres and approximately 50 single-family detached homes.

- Leitch Estates Neighborhood – Leitch Estates straddles Argenta Trail just north of 70th Street. This area, which includes 46 acres of land currently, contains approximately 33 single-family detached homes.

- Inver Grove Acres/Scales Landmark Addition Neighborhood – The two subdivisions that comprise this neighborhood include 90 acres of land. This area, which is located north of 70th Street across from Inver Wood Golf Course, includes approximately 31 single-family detached homes.

- MacGregor Acres Neighborhood – The MacGregor Acres neighborhood is located off of South Robert Trail with access being provided by High Road. This area includes approximately 19 single-family detached homes on 89 acres of land.

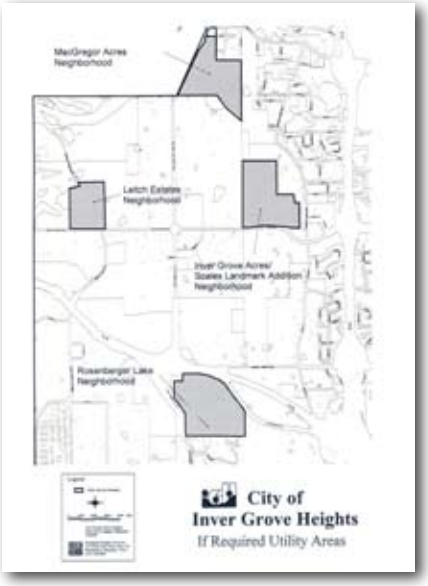


Figure 2.13: Exception Neighborhoods

In all of these areas, past zoning practices have established substantial concentrations of smaller lots of various sizes. In each case, the neighborhood areas are virtually fully developed with only isolated lots potentially available for further home construction. In all of these areas, the existing on-site sanitary sewer treatment systems are performing adequately and large-scale problems are not present. As a result, the City anticipates that these areas will not change over the next 20 years unless environmental problems develop in the future.

The comprehensive plan includes these four neighborhood areas within proposed MUSA line expansions, however, they are expected to remain as islands without sanitary sewer unless unforeseen circumstances occur. These properties would only receive sanitary sewer service in the future "if required"

Figure 2-14: MGT Concept Plan

A rendered site plan concept of a development proposal in the NW Area that implements open space and storm water management principles and policies.

or "if desired" by the property owners. Requiring the area to be served by sanitary sewer would only happen if substantial quantities of on-site systems exhibit future failures and no other action can be taken to provide proper treatment. These neighborhoods are considered permanent land uses and the land use plan does not contemplate further lot divisions and/or platting.

Northwest Area

Northwest Inver Grove Heights is an area of unique natural features including varying topography, mature tree cover and wetlands. Because of the terrain in the area, unique development practices are warranted. In the last several years, the City of Inver Grove Heights has conducted a number of planning and engineering analyses for the Northwest Area in order to determine the areas capacity for future growth based on the premise that storm water will be managed on site and not conveyed through a pipe to outlet into the Mississippi River. These studies were essentially identified as projects in the 1998 Comprehensive Plan.

Based on these studies, the City has implemented a zoning ordinance to further guide development, is in the process of constructing utilities and is processing the first development applications for the area.

This comprehensive plan update modifies some of the land uses previously guided for the Northwest Area. These modifications are based on what we have learned over the last eight years of planning work completed in the Northwest Area as well as reflections of recent development proposals and comprehensive plan amendments. Two key guidelines were adhered to in modifying the land uses in the Northwest Area. 1) the development projections assumed within the Northwest AUAR remain higher than those projected for the 2008 Comprehensive Plan update, thus rendering the AUAR still effective and not impacting the design capacity of future infrastructure. 2) the assumptions used to determine how infrastructure improvements are financed remain on the low side, thus making sure that we project to exceed the amount of development needed to ensure the delivery of infrastructure to the Northwest Area is financially feasible.

Solar Access

State legislation enacted in 1978 requires local comprehensive plans to address solar access protection. The law requires that communities make efforts to ensure that direct sunlight access to solar panels is not subjected to shading from nearby trees, buildings or other structures. In the 1980s, energy prices and potential fuel shortages focused attention on both passive and active solar collection systems. Since that time, however, lower energy prices have diminished interest in active solar energy collection systems. While solar energy issues are seldom discussed during subdivision reviews today, it is possible that conditions will change in the future. Accordingly, the City will take the following measures to ensure protection of solar access where appropriate:

1. Examine the existing Subdivision Ordinance to ensure that it adequately includes solar energy protection measures.
2. Encourage the design of new subdivisions in a manner that allows the maximum number of new buildings to receive sunlight sufficient for solar energy systems. The city will encourage the siting of buildings and vegetation in a manner that allows unobstructed sunlight to reach the south sides of structures between the hours of 10:00 AM and 2:00 PM.
3. The City will assemble and make available, information pertaining to design criteria for solar access. Such criteria will also be used by staff in reviewing new subdivision proposals.
4. Consistent with State Statutes, the city will consider variances in circumstances where hardships are imposed because of the inability of structures to obtain direct sunlight for solar energy systems because of existing zoning and subdivision ordinance provisions.

Summary

Our land use patterns have not changed dramatically since our last Comprehensive Plan. The land use assumptions and development projections outlined in this chapter form a basis for the remaining chapters of our Comprehensive Plan.

Natural Resources & Environmental Protection

Chapter 3

Harmon Landscape

Introduction

An inventory of natural resources for a community typically includes soils, lakes, wetlands, ponds, topography, vegetation and floodplains. All of these resources lend definition to the City of Inver Grove Heights. The landscape of the community is defined by the rolling topography, the stands of mature timber, wetland depressions, the scattered lakes and the Mississippi River, which forms the eastern boundary of the community.

In 1997, Inver Grove Heights' residents were asked to help define a future vision for the community. They sited unique topography, open spaces and the Mississippi River frontage as important community assets. In 2008, the community was asked to define the characteristics of a "healthy community" and again environmental features were a common result. Respecting the natural environment pays us great dividends over the long term. A healthy urban forest helps shade our community. Wetlands help clean our lakes and water resources. Intact open spaces serve as amenities that contribute to an enhanced quality of life and as a safe haven and home to an abundant wildlife population displaced as a result of urban development. Because of the importance of these open space areas and natural features in the community, they need to be carefully considered as part of the comprehensive planning process. In doing so, it is possible to preserve outstanding resource areas and create a future living environment that integrates the man-made development pattern within the natural characteristics of the landscape.

Environmental Protection Policies

1. Promote conservation of key natural resources.
2. Establish a balance between the protection of natural resources and future urban development.

Existing Conditions

Geology

The terrain of Inver Grove Heights is the result of various periods of glacial activity that occurred thousands of years ago. The pre-glacial terrain has been so thoroughly covered by glacial materials that the exact original form is unknown. On the surface, three distinct geologic forms can be identified. The first, glacial moraine, also known as knob and kettle topography represents a distinct feature in Inver Grove Heights. This large area contains the actual materials that were carried by the glacier and left in place when it melted. Today, these are represented as small lakes, ponds, wetlands and potholes that usually have small drainage areas and often contain trapped water due to a lack of natural outlets.

The knob and kettle terrain feature offers a potential for providing a series of storm water holding basins. The natural drainage of an area can be contained in these basins. Controlled outlets and inlets combined with interconnecting storm sewer pipes can allow these natural basin areas to function as part of a storm water collection and treatment system.

The second geologic feature evident in Inver Grove Heights is the outwash plain. Central Dakota County contains a large outwash plain with a finger of the plain extending into Inver Grove Heights. This channel carried away much of the fine silt and loam away from the glacier resulting in the rich agricultural land found south of the community.

The third geological feature was formed as an indirect result of glacial activity. The Mississippi River was the primary spillway for the glacial Lake Agassiz, which encompassed what is now the Red River Valley. The lake drained via the Minnesota River leaving a landscape with a broad river bottom floodplain and steep side slopes in southern Inver Grove Heights.

Topography / Hydrology

The topographic and hydrological features of Inver Grove Heights are closely tied to the glacial history. Glacial activity resulted in a landscape that features significant topographic changes in a number of areas in the community (see Figure 3.1). The landscape along the Mississippi River contains steep slopes in the central and southern reaches of the community. Two primary fingers of steep topography extend to the north and northwest, one following up the Marcott chain of lakes and the other lying between the Lafayette Freeway and Cahill Road. North and South Valley Parks lie within this area. Additionally, a large concentration of land exhibiting slopes exceeding 12% lies north of Cliff Road and west of Rich Valley Road.

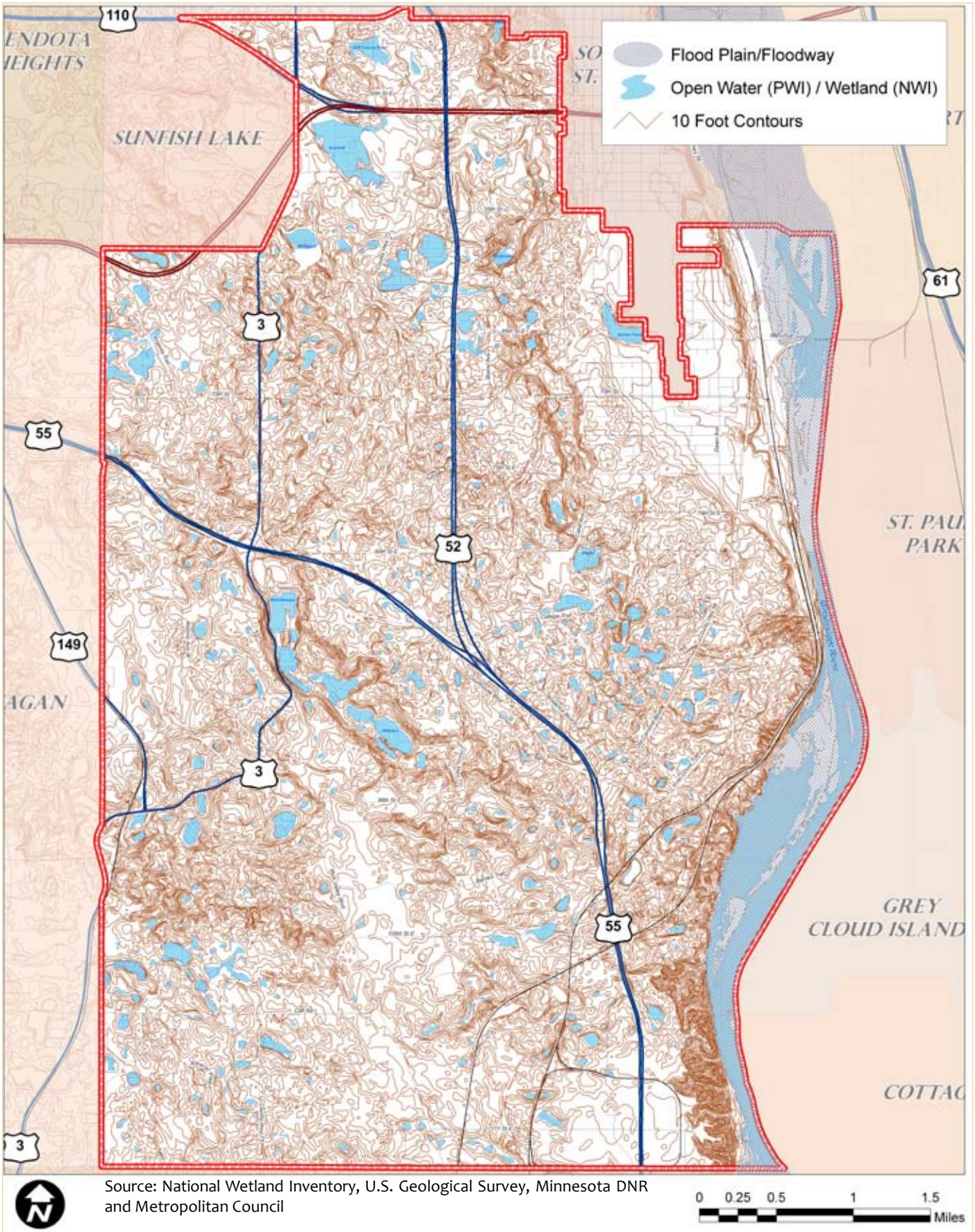
Aggregate Resources

State legislation enacted in 1978 requires local comprehensive plans to address aggregate resources. The law requires that communities include the local government's goals, intentions, and priorities concerning aggregate resources as part of their land use plan. Aggregate resources known or suspected to be located in Inver Grove Heights are illustrated in Figure 3.2. These areas are made up of three types of aggregate resources:

- Class 6 - Des Moines Lobe Sand and Gravel 10-40 ft thick, moderate to good quality
- Class 7 - Superior Lobe Sand and Gravel 10-40 ft thick, good to excellent quality
- Class A - Prairie du Chien Dolostone > 30 ft thick

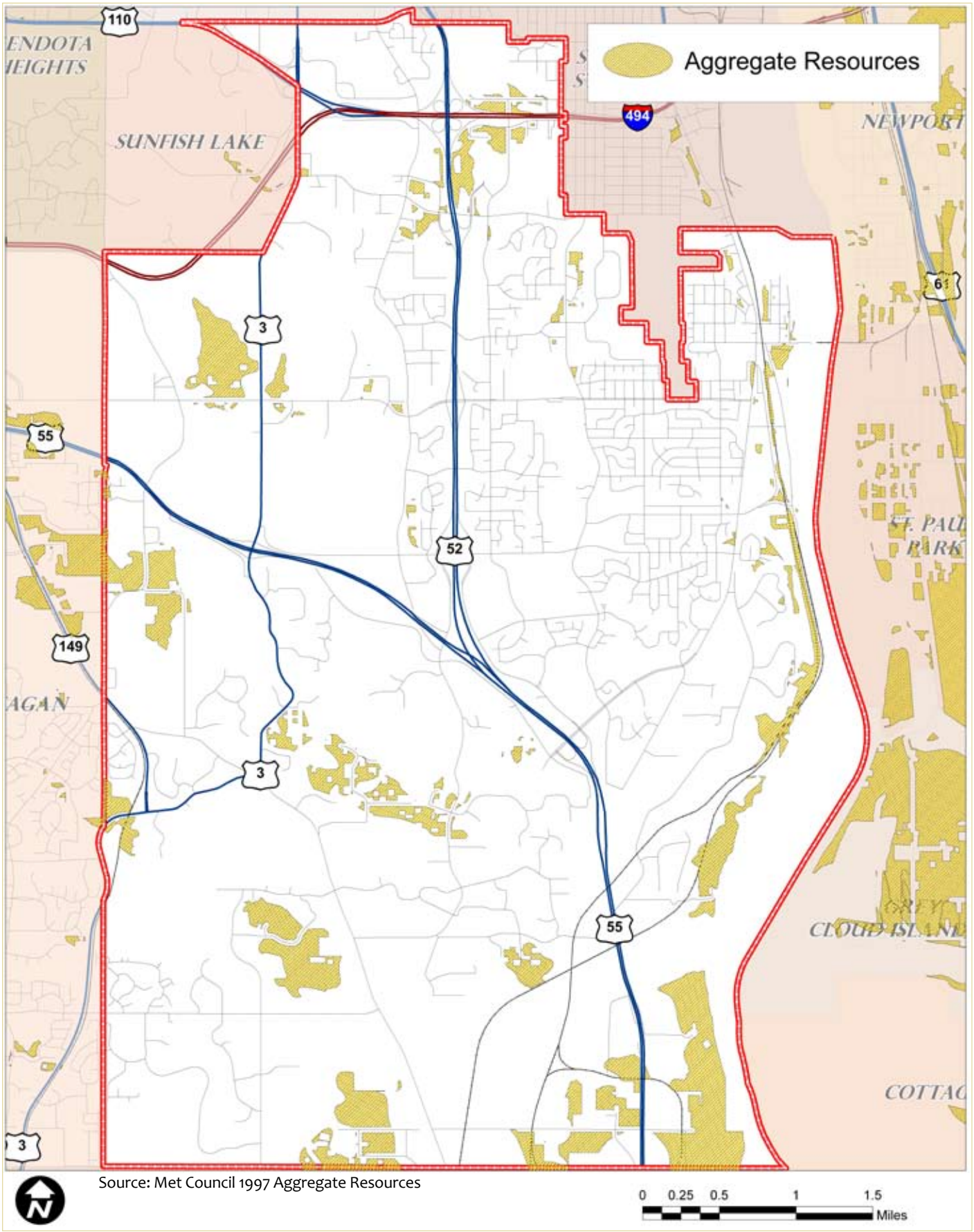
Aggregate resources identified in the City of Inver Grove Heights are dispersed throughout the community. It is unlikely extraction would occur in the areas along the Mississippi River as a result of the bluff line and potential environmental impacts to the river. It is also unlikely to see extraction in areas of the community that are fully developed. Areas that may see extraction are in the more rural or undeveloped areas of the community. Prior to development on these sites, the City will explore with property owners the feasibility of extracting resources and will follow all required state laws in order to understand the potential impacts of mineral extraction.

Figure 3.1: Topography, Wetlands & Flood Plain/Floodway



Source: National Wetland Inventory, U.S. Geological Survey, Minnesota DNR and Metropolitan Council

Figure 3.2: Aggregate Resources



Source: Met Council 1997 Aggregate Resources

Soils

Undeveloped areas of Inver Grove Heights in the southern and northwestern portions of the community have similar soils characteristics (see Figure 3.3). The areas generally contain Kingsley-Mahtomedi soils and Waukegan-Wadena-Hawick soils. Kingsley-Mahtomedi soils are prominent in the southern part of the City while the Waukegan-Wadena-Hawick soils run in a band from northwest to southeast through the Marcott Lakes area. The northwestern portion of the City also contains substantial pockets of Otterholt silt loam. The following are the characteristics of these soils:

- Kingsley-Mahtomedi - This class of soils is made up of 40 percent Kingsley, 12 percent Mahtomedi and 40 percent minor soils. Kingsley soils typically consist of a black sandy loam surface layer approximately 8 inches thick. The subsurface layer is brown loamy sand about 4 inches thick. The subsoil is 26 inches thick; the upper part is dark brown and reddish brown sandy loam and the lower part is dark brown sandy loam. The underlying material is dark brown sandy loam with layers of loamy sand.

  This soil is suited for the use of an individual sewage treatment system. Loam soils are resistant to compaction while containing clay and silts, which often retain the moisture and microbes necessary for the treatment of effluent. Loam soils typically have good surface drainage and a favorable percolation rate.

  Mahtomedi soils typically have very dark grayish brown loamy sand approximately 5 inches thick. The subsoil is dark brown and dark yellowish brown gravelly coarse sand about 30 inches thick. The underlying material to a depth of about 60 inches is yellowish brown stratified sand and coarse sand. Individual sewage treatment systems in Mahtomedi soils can be adequately installed and maintained.

  Kingsley-Mahtomedi soils are generally poorly suited to most cultivated crops due to erosion, complex slopes and susceptibility to drought.

- Waukegan-Wadena-Hawick - This class of soils is approximately 36 percent Waukegan, 22 percent Wadena and 8 percent Hawick soils. The remaining 34 percent consists of minor soils.

Aggregate Resources

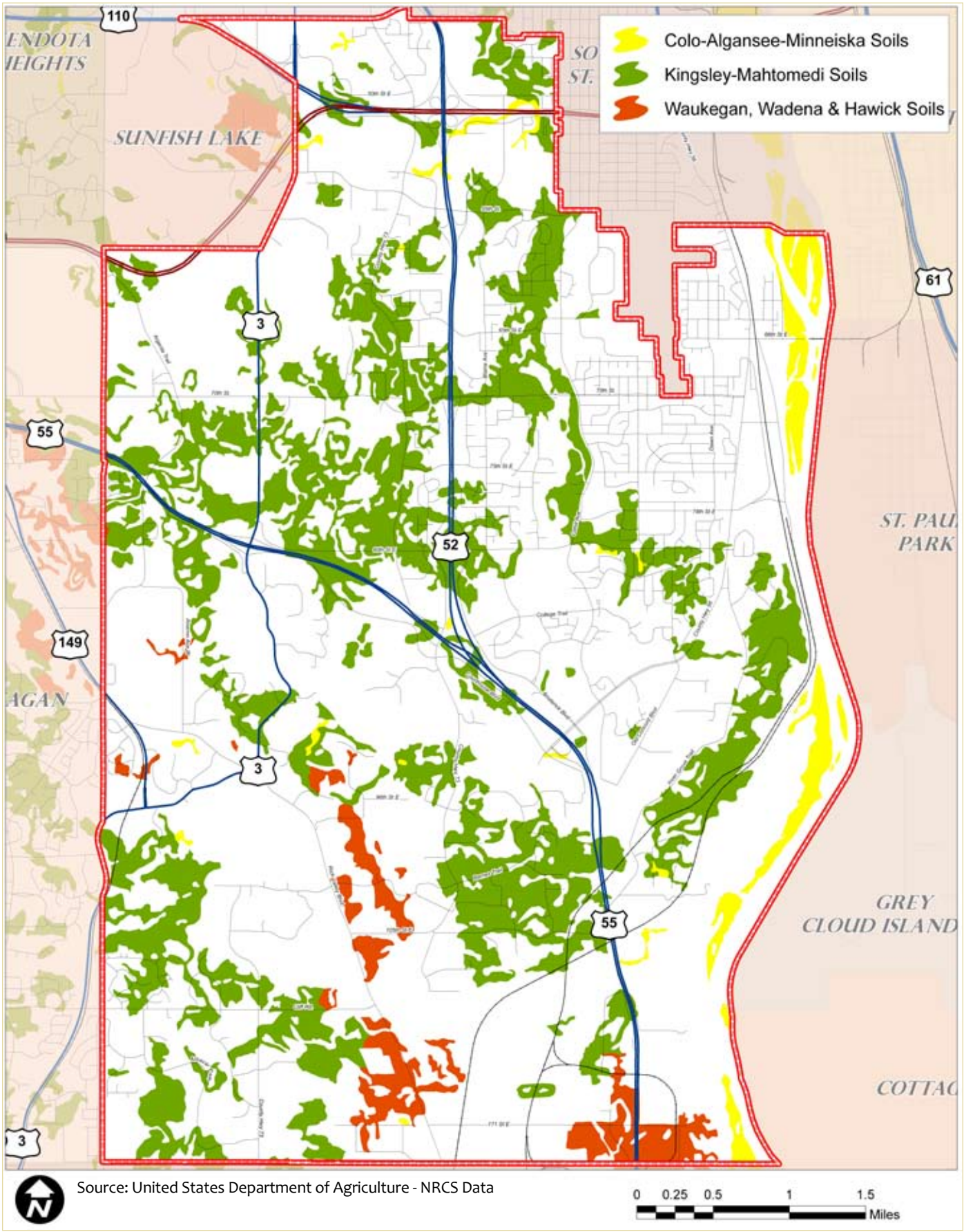
Aggregate Resources Inventory of the Seven-County Metropolitan Area, Minnesota, is the report from a project funded jointly by the Minnesota Department of Natural Resources, the Metropolitan Council, and the Minnesota Geological Survey. It was released on May 9, 2000 as Minnesota Geological Survey Information Circular 46.

Among its conclusions, the report shows that the Twin Cities region was originally endowed with a total of 5.7 billion tons of sand and gravel, and dolomitic bedrock that meet present-day industry standards for construction aggregate resources. Only 1.7 billion tons of these resources remained as of 1997. With the continuing expansion of developed areas, possible zoning restrictions, and other factors, aggregate supplies may be exhausted as early as 2028. Local and regional decisions will have important implications for future supplies and costs of aggregate materials.

Not protecting our available aggregate resource supply can have costly impacts to community development. These costs would be born due to the need to transport aggregate for construction projects.

Source: Minnesota Department of Natural Resources

Figure 3.3: Soils



The Waukegan soils are well drained silt loams with a bottom layer of gravelly sand. This soil is similar to the Kingsley soil and is suited for individual sewage treatment systems. The Wadena soils are also well drained loams, sandy loams and loamy sands. Hawick soils are sandy loams, loamy sands and gravelly sands. The Wadena and Hawick soils have characteristics similar to Mahtomedi soils and are suitable for individual sewage treatment systems with appropriate testing to assure the soil will filter the effluent. Waukegan-Wadena-Hawick soils are also well suited for cultivated crops as well as road and building construction.

- Otterholt Silt Loam - Otterholt silt loam is a well drained soil on side slopes and broad hillcrests on end moraines. Individual areas are irregular in shape and range in northwest Inver Grove Heights from less than 5 acres to up to 30 acres. The surface layer of Otterholt soils is typically very dark grayish brown and about 2 inches thick. The subsurface layer is brown silt loam about 9 inches thick. The subsoil is about 24 inches thick. It is dark yellowish brown silt loam. The underlying material to a depth of about 60 inches is reddish brown sandy loam to dark brown loam. In some areas, the silt mantle is less than 30 inches thick.

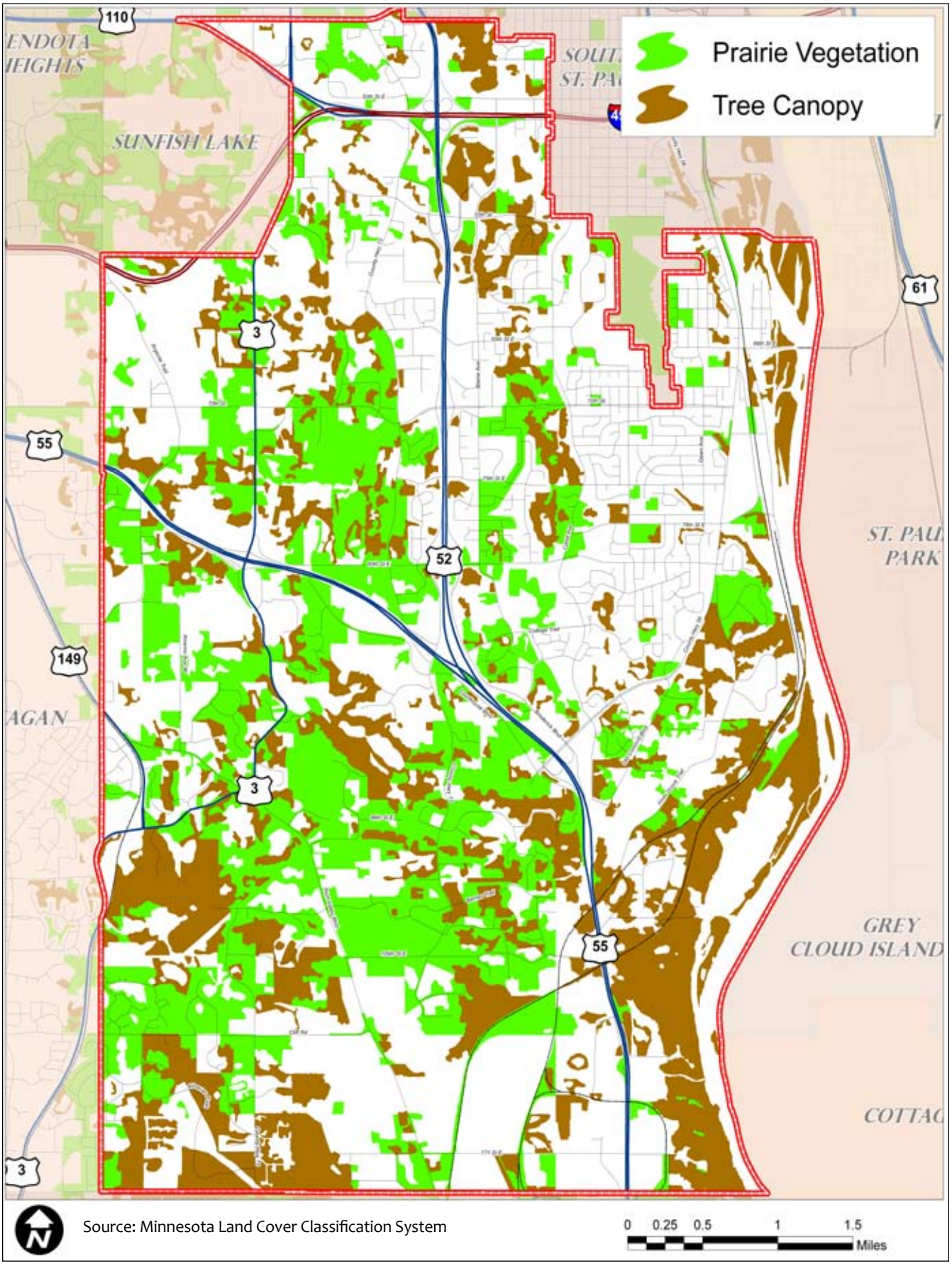
  If buildings are constructed on Otterholt soils, foundations and footings should be designed to accommodate the shrinking and swelling of the soil. The moderate permeability of Otterholt soils restricts its use for septic tank absorption fields. This soil is well suited to agricultural crops, however, it erodes easily.

Vegetation

Inver Grove Heights contains three distinct plant communities, the upland forest, prairie and wetlands (see Figure 3.4). Upland forests or upland forest remnants can be found in virtually all areas of the city. Wetlands are also scattered throughout the community with a concentration in the south and east. Prairie plant locations are also interspersed throughout the city.

Oak and aspen dominate the upland forest areas with understory growth including dogwoods and ferns. Prairie areas contain a variety of species of grasses as well as poplar, sumac and cedar. Wetland fringes contain stands of birch, willow, ash, elder and poplar with an understory growth of red twigged dogwood, viburnums and varieties of wildflowers.

Figure 3.4: Vegetation



Vegetation in Inver Grove Heights provides both functional and aesthetic benefits. Vegetation serves to clean water, prevent erosion, provide wildlife habitat, modify climate and frame scenic views and vistas.

Lion's Lake

Future Environmental Impacts

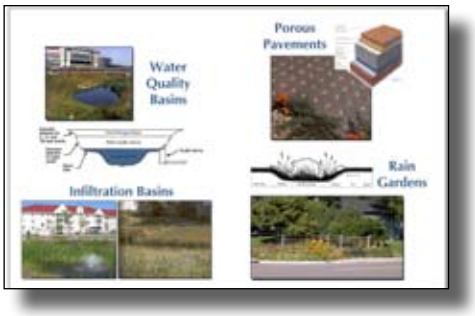
The City of Inver Grove Heights will continue to develop over the next 20 years adding new homes and jobs to the community. Future development patterns may pose environmental concerns and influence the City's landscape. The land use plan has taken into account environmental features and sets the foundation for future development patterns. Areas that are anticipated to develop, such as the Northwest Area has gone under extensive planning efforts to ensure the environment is protected. For example, the City has invested in an Alternative Urban Areawide Review (AUAR) and a Natural Resource Inventory and Management Plan (NRI) for this area. The City will continue to address environmental impacts in developing areas to ensure the appropriate mitigation measures are taken to preserve and protect the environment.

Several sites in Inver Grove Heights will continue to pose environmental concerns. Examples include the Pine Bend Landfill, two demolition landfills and the Flint Hills Refinery. The land use plan has introduced a new land use category titled "Industrial Open Space." The purpose of the land use category is to serve as a buffer between the heavier industrial uses and incompatible rural residential land uses to the west. The City will need to continue working closely with the owners of these heavier industrial uses as well as state and federal agencies in order to contain these operations and minimize direct and indirect impacts on the environment in general and specifically on abutting properties. Lands held within these buffer areas can continue to operate under existing conditional use permits; with undeveloped areas to be left as open space and where possible restored to a more natural state (native plants and habitat) and maintained through a management program. Agricultural uses will continue to be an acceptable interim use within the buffer areas.

The Northwest Area

Since the late 1990s, the City of Inver Grove Heights has conducted a number of planning and engineering analyses for the Northwest Area. Each

of these analyses had a different set of objectives. However, they each had a common goal in mind: to guide the way for a new form of development that demonstrates environmental sustainability. The result of this effort is somewhat pioneering in the Twin Cities. An ordinance was established that mandates a fair and reasonable open space pattern, achieves an efficient density of development, protects natural resources and preserves areas that will allow the maximum amount of storm water infiltration. After years of planning for the Northwest Area, development broke ground on the first projects in the late summer of 2008.



Stormwater management best practices are required in future development projects within the Northwest Area. The above illustration is a part of a development submission demonstrating how a project intends to manage stormwater runoff using innovative solutions as outlined in the City of Inver Grove Heights Stormwater Management Manual.

Implementation

Environmental Protection Policies

In order to enhance environmental protection, the City will:

1. Continue to carefully monitor development by requiring Environmental Assessment Worksheets, Alternative Urban Areawide Reviews and/or Environmental Impact Statements where they are needed in order to properly assess the environmental impacts of proposed development. The City will also update the NW Area AUAR when needed.
2. Incorporate performance standards into construction contracts with plats in order to provide specific controls within developments where warranted.
3. Review and update existing development checklists to address environmental concerns related to development projects.
4. Consider reestablishing a program of periodically testing water bodies within the community in order to assess the long-range effects that urbanization has on these water bodies and correspondingly, in order to undertake any necessary protective measures that may be pointed out through this monitoring system.
5. Emphasize proper management of open space areas in order to preserve the trees, steep slopes, water quality and similar significant features of these areas.
6. Cooperate with the County and other levels of government in providing for the removal of diseased trees.
7. Encourage re-forestation within the corporate limits, which is dominated by oaks, which are susceptible to disease, damage, by storms and construction damage.

What is Low Impact Development (LID)?

LID is an ecologically friendly approach to site development and storm water management that aims to mitigate development impacts to land, water, and air. The approach emphasizes the integration of site design and planning techniques that conserve natural systems and hydrologic functions on a site. The practice has been successfully integrated into many municipal development codes and storm water management ordinances throughout the United States. Specifically, LID aims to:

1. Preserve Open Space and Minimize Land Disturbance;
2. Protect Natural Systems and Processes (drainage ways, vegetation, soils, sensitive areas);
3. examine the Use and Sizing of Traditional Site Infrastructure (lots, streets, curbs, gutters, sidewalks) and Customize Site Design to Each Site;
4. Incorporate Natural Site Elements (wetlands, stream corridors, mature forests) as Design Elements; and
5. Decentralize and Micromanage Storm Water at its Source.

Source: NAHB Research Center

What is LEED?

The LEED Green Building Rating System™ is the nationally-accepted benchmark for the design, construction, and operation of high performance green buildings. LEED promotes sustainability in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

The LEED for Neighborhood Development Rating System is currently a pilot program and integrates principles of smart growth, urbanism, and green building into the first national standard for neighborhood design. LEED certification provides independent, third-party verification that a development's location and design meet accepted high standards for environmentally responsible, sustainable, development.

Source: U.S. Green Building Council

8. Assist with the preservation of prime agricultural lands in order that they are farmed as long as desired by property owners within the community.
9. Continue monitoring private septic systems in order to safeguard against contamination of the underground water system and related health problems.
10. Continue to require appropriate erosion controls during construction.
11. Incorporate select stands of timber into permanent open space areas as part of traditional platting and planned unit developments.
12. Encourage efforts to preserve endangered and threatened wildlife species including preservation of natural habitat areas where feasible.
13. Enforce federal, state and local wetland rules and regulations.
14. Cooperate with state and federal agencies to achieve compliance with air quality, water quality and noise regulations.
15. Work closely with state and federal agencies involved in the regulation and monitoring of heavy industrial users such as the refinery and landfill operations.
16. Continue to regulate existing landfills and closely coordinate with regional agencies, landfill operators and residents.
17. Continue to work closely with the refinery businesses and local agencies to communicate needs, collaborate on planning, monitor air quality and ground water and coordinate emergency management.
18. Continue implementing the Northwest Area zoning ordinances as a model for innovative storm water management and development patterns.
19. Encourage the use of Low Impact Development (LID) techniques that preserve and enhance our environment.
20. Continue to enforce tree preservation ordinance with new subdivisions and update the ordinance as new information or techniques become available.
21. Continue working with Dakota County to identify old dump sites and seek remediation as development occurs.
22. Encourage private development projects to seek LEED certification for new construction of buildings.
23. Consider LEED certification for new public buildings.
24. Encourage future subdivisions to explore the design principles that are encouraged through the LEED for Neighborhood Development program.

Housing
CHAPTER 4

Introduction

Housing is an integral part of Inver Grove Heights' vision (see page 1-4). Developing and maintaining a diversity of housing opportunities is a key guiding principle of the Comprehensive Plan. Ensuring opportunities for diversity in housing also helps achieve community "sustainability" (see sidebar on Page 1-6.) To be sustainable, Inver Grove Heights approach to housing is to provide opportunities for housing at all stages of the life-cycle and at a full range of price levels and design patterns. This approach to housing will help sustain:

- our K-12 school system by supporting a more consistent demographic;
- a strong economic environment that is supported by a diverse population base and labor force;
- a market for commercial development (goods and services) supported by a diverse mix of households (household purchase power) within close proximity to shopping; and
- a market for alternative transportation options such as local, express or fixed route transit systems supported by a density of housing that supports an efficient transit system.

Enacted in 1976, the Metropolitan Land Use Planning Act (MLUPA), Minn. Stat. Sec. 473.859 Subd. 2, paragraph [c] requires inclusion of a housing element in the Comprehensive Plan to address key housing needs identified from a regional basis. This plan will identify the plans, policies and programs intended to meet these needs for Inver Grove Heights.

Land Use Planning Act-Minn. Stat. Sec. 473.859 Subd. 2, para [c].

A land use plan shall…include a housing element containing standards, plans and programs for providing adequate housing opportunities to meet existing and projected local and regional housing needs, including but not limited to the use of official controls and land use planning to promote the availability of land for the development of low and moderate income housing.

The City's role in housing.

The City of Inver Grove Heights does not develop or build housing. Actual development of housing is a function of the market place through public and private housing developers and lenders. Through legislative powers, the City has the responsibility to enact planning, zoning and building laws that regulate housing development. It is also the responsibility of the City to ensure an adequate level of services to maintain strong neighborhoods.

Background

In March of 2004, Inver Grove Heights City Council appointed a Housing Task Force to evaluate the City's housing supply and develop a housing action plan. This action plan built upon the recommendations, goals and policies from the 1998 Comprehensive Plan and the housing goals established through the Liveable Communities Act in 1995 and reaffirmed in 1999. Ultimately, the Task Force prepared a report with a series of suggested strategies that was adopted by the City Council (see resolution 05-87 adopted May of 2005). These strategies are summarized as follows:

A. Utilize the following financial resource tools to help achieve workforce/affordable housing:
   1. Community Land Trust
   2. Community Revitalization Fund (CRF)
   3. Community Development Block Grant funds (CDBG)
   4. Home Program
   5. EDA/HRA Levy as authorized by state statute
   6. Livable Communities Act
   7. Minnesota Housing Finance Agency Programs (MHFA)
   8. Reducing or waiving city development fees.

B. Utilize the following non-financial resource tools to help achieve workforce/affordable housing:
   1. Density bonuses
   2. Site identification
   3. Scattered sites
   4. Zoning regulations and development standards
   5. Dakota County CDA
   6. Habitat for Humanity/Private Foundations

A more detailed description of these resources can be found as an appendix to the Comprehensive Plan.

In November of 2005, the Dakota County Community Development Agency completed a Needs Assessment for all of Dakota County. This report estimated a demand for approximately 1,580 new rental and 6,055 for sale housing units (7,635 total units) in Inver Grove Heights from 2000 to 2030.

Together, these two reports provide the policy directions for the Comprehensive plan update.

Housing Stock, Trends and Patterns

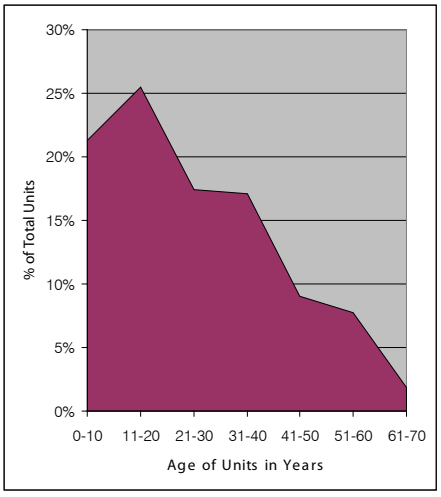
2000 Census data indicated that there were approximately 11,452 housing units in Inver Grove Heights and that 54% of these units were reported to be within single family detached homes. Between 2001 and 2007, Inver Grove Heights has seen a total of 2,242 new housing units added to its housing supply at an average rate of 320 units per year (per City building permit records.) Of these units, roughly 20% were single family detached units, 80% were attached housing (side by side townhome type units or stacked apartments). When added to the existing housing stock, Inver Grove Heights has an estimated housing diversity mix in 2008 of approximately 49% SF detached and 51% MF attached housing types.

Our land use plan guides future development areas for a balance of single family detached and attached housing types as well as multi-family attached housing. Our goal is to preserve an even balance of housing with approximately 50% single family detached and 50% multi-family attached housing. The following is a summary of vacant developable lands guided for residential development within the City of Inver Grove Heights.

Table 4.1 Land Capacity for new housing

Residential Land Use (Density in net units per acre)	Developable Acres	Min Units	Max Units
Rural (2.5 acre or greater lot size)	739	NA	NA
Low Density (1-3 u/a)	632	632	1,896
Low Medium (3-6 u/a)	537	1,610	3,222
Medium (6-12 u/a)	287	1,722	3,444
High (12 + u/a)	21	249	630*
Mixed Use (12+u/a)	55	663	1,650*
TOTAL Acres:	2,271	4,875	10,842

* Assumed 30 units as a maximum density for High Density and Mixed Use



The graph above illustrates the bulk of Inver Grove Heights Housing being constructed in the last two decades.

Using the numbers referenced in this section, it is estimated that the City currently has approximately 13,700 total housing units, nearly half of which are less than 20 years old. However, as Inver Grove Heights continues to age, a growing priority will be on preserving and maintaining the existing housing stock.

Table 4.2 Age of Housing Stock

Age of Housing Stock	Units	% of Total
2000 to 2007	2,450	18%
1990 to 1999	3,767	28%
1980 to 1989	2,445	18%
1970 to 1979	2,407	18%
1960 to 1969	1,267	9%
1940 to 1959	1,092	8%
1939 or earlier	265	2%
Total Units	13,693	100%

*Source: US Census--City Building Permit Data

Housing values in Inver Grove Heights continue to reflect typical characteristics of suburban new home construction where housing costs are heavily influenced by the rising cost of land and infrastructure, particularly as raw land becomes scarcer and areas left for infrastructure expansion are more difficult to serve.

Dakota County Assessors data for Inver Grove Heights indicated that the average residential property (excluding apartments) had an estimated market value in 2007 of approximately $260,000. Assessors data also indicted that sale prices for single family homes in Inver Grove Heights averaged approximately $325,000 over the last three years.

Housing Maintenance

With the aging of our housing stock, preservation and maintenance will continue to be a critical objective for the City. The City has recently created a new position titled, "Code Compliance Specialist." This position is responsible for handling complaints regarding code violations. This staff person also helps answer questions, educates citizens and connects interested homeowners with housing resources.

Affordable and Workforce Housing

Affordable housing is an important part of a communities vitality. It provides housing for young people who are in transition from home and college into the workforce and it provides housing for seniors and others who live on fixed incomes. A term often used in relation to affordable housing is "workforce housing." Workforce housing is increasingly popular among planners, government administrators and housing activists, and is gaining popularity with home builders, developers and lenders. Four key factors help understand workforce housing: affordability (see sidebar), home ownership (recognizing the most desirable form of housing is ownership), critical workforce (teachers, police officers, medical technicians/nurses, office workers, retail workers), and proximity (to a major employment concentration). For the Inver Grove Height's comprehensive plan we refer to workforce housing as one component of affordable housing needs. We will use the term affordable housing, because it captures the full intent of the need; it includes seniors living on fixed incomes and those college students preparing for the workforce.

Affordable housing is most commonly achieved through development of new attached housing projects (townhome, condo or apartment development) where residential densities are sufficient enough for the private market to keep development costs reasonable. Programs through the Dakota County

Affordable Housing Limits

The Metropolitan Council has defined affordable housing as that which costs no more than 30% of ones household income for a household with a median income of 60% or less of the Metropolitan Average HH income. In 2008, this equates to a figure of $158,000 assuming a 30 year mortgage at 6.125% interest. Rental housing is affordable at 50% of area median income and is approximately $910 for a 2 bedroom apartment. Affordable housing for a household at 80% of the area median income is set at $214,900 for an owner occupied unit.

2000 census data indicated that 20% of renters in Inver Grove Heights were paying more than 30% of their income toward housing costs.

Example of an affordable housing unit mixed into a market rate development project.

This housing development is located within Plymouth, MN. Part of the development project included the integration of affordable housing. These units were made affordable through regional grants and the underwriting of a second mortgage through the Plymouth HRA.

In this picture, there are four units. One is maintained as affordable (i.e. can't be sold outside of defined affordability limits) for up to 15 years.

Challenges in Providing Affordable Housing

The ability of the market place to provide affordable housing is constrained by land and infrastructure costs, building material costs, regulatory barriers (restrictive zoning and land use controls) and local resident opposition (often referred to as NIMBY or Not In My Back Yard).

Public subsidies are usually required to make affordable housing a reality. When public subsidies enter the picture, challenges arise with how the property will be owned, managed and maintained, how the project is financed and how the affordability of the housing will be preserved.

Community Development Agency or other regional non-profit organizations also contribute to the development of new workforce housing in Inver Grove Heights. The other important provider of affordable housing stock is the existing housing stock. As housing ages, the degree of affordability increases. However, maintenance costs with older housing stock also increases. It is also important to acknowledge the aging population in Inver Grove Heights and the region in general. Housing affordability is important to retired persons who are living on fixed incomes and often unable to keep pace with rising housing costs.

In 2005, the Metropolitan Council developed a new methodology to understand the regions workforce housing/affordable housing needs and to allocate that need across communities in the Metropolitan Area. This methodology is detailed in a report titled "Summary Report: Determining Affordable Housing Need in the Twin Cities, 2011 – 2020" published in January of 2006. This report is included as an appendix to this document. The study suggests that the amount of affordable housing needs are influenced by the following factors:

- A community's anticipated growth rate and available land supply guided for residential development.
- The proximity of local low wage jobs.
- The proximity of local low wage labor pool.
- The existing stock of affordable housing.
- Availability of transit service.

Using these factors in a formula that is fully described in the Metropolitan Council's report, Inver Grove Heights affordable housing need is identified as 871 new construction housing units between the years 2011 and 2020 as determined by the Metropolitan Council.

Table 4.3 Demonstration of Capacity to Meet Affordable Housing Share

Residential Land Uses	Minimum	Maximum	2010	2020	Absorption 2010 to 2020	Units*
	Density u/a		(total acres)		(acres)	
Medium Density Residential	6	12	589	680	91	545
High Density Residential	12	24	153	166	13	159
Mixed Use Residential	12	30	0	32	32	383
Total	-	-	742	878	136	1,086

** Unit count is based on minimum density per land use category*

Foreclosures

The rising number of foreclosures poses a potentially significant community issue for Inver Grove Heights and the region in general. The City does not track home foreclosures; however, information from the Dakota County Community Development Agency (CDA) shows 99 foreclosures in 2007 and 37 through March of 2008. Regional trends suggest that annual totals will grow in 2008 and beyond. The impacts of home foreclosure can be many, but the most notable impact is the rapid deterioration of homes that are un-maintained and the potential loss of an existing housing unit that can be damaged beyond repair. One foreclosed home in a neighborhood can then be the cause of drawing down surrounding property values and damaging the neighborhood's identity and quality of life.

A key goal of this plan will be to monitor housing foreclosures and enable the city to be ahead of the game to ensure homes are prevented from damage as a result of foreclosure. For those homes that do go into foreclosure, the City will work with lending institutions and housing agencies to convert or preserve these homes as potential workforce housing opportunities.

Aging of the Population

While there is no doubt that the region's population will grow older over the life of this Comprehensive Plan, the implications for housing in Inver Grove Heights are less clear.

- How long will residents stay in their current homes (age in place)?
- If people want to move, are desirable and affordable housing options available in Inver Grove Heights?
- Will economic conditions encourage different family and non-family household structures to live in Inver Grove Heights (adult children with parents, parents with adult children, groups of unrelated seniors)?

Some aspects of the current housing stock suggest potential barriers for the population aging in place. Many single family detached homes built in the last 20 years were built for families (two story, split-entry or split-level) and all will require the normal maintenance. As our population ages, maintenance is often challenged by our physical ability to conduct regular household tasks, and as financial resources become limited (fixed through retirement) housing maintenance can begin to suffer. The Dakota County's Housing Needs Assessment shows future demand for senior housing. This demand is

important to serve so that seniors have housing options within the community that meet their life-cycle needs and facilitate the turnover of housing.

Inclusionary Zoning

"How do you meet the needs of developers that want approval for higher density projects and also provide communities with the affordable or workforce housing they need? Inclusionary zoning is a possible answer. Originally conceived in the 1960's, and adapted over the decades, today's inclusionary zoning programs offer developers incentives in return for including affordable units within market-rate developments. Inclusionary zoning can be developed to offer incentives, reduce barriers or require developments of a certain magnitude to integrate workforce housing." Urban Land Institute.

Implementation

Housing Policies

The following policies will guide the City of Inver Grove Heights housing development.

1. Maintain land use guidance of a sufficient supply of land at 6 units per net acre or more to accommodate Inver Grove Heights share of the regional affordable housing needs.
2. Work with the Dakota County Community Development Agency and other agencies to integrate affordable housing into larger development projects rather than isolated into a single development project.
3. Partner with housing development agencies to assist with the development of affordable housing in locations of the community that have (or will have) adequate transit services and are in close proximity to major employment centers.
4. Maintain a balanced housing supply with housing available for people at all income levels and unit types that meet the varying life-cycle needs of Inver Grove Heights residents.
5. Promote ongoing maintenance of owner occupied and rental housing units through code compliance, homeowner education and providing technical resources.
6. Establish a housing pattern that respects the natural environment while striving to meet local housing needs and the community's share of metropolitan area housing growth.
7. Maintain zoning and subdivision regulations allowing for the construction of workforce housing.
8. Maintain a close working relationship with the Dakota County Community Development Agency to provide necessary financial programs to promote the construction of workforce housing.
9. Continue to utilize City ordinances that allow planned developments that provide a mixture of housing types.
10. Promote the development of multi-family housing in areas that are physically suited to higher densities
11. Require the integration of open spaces within residential developments in order to maintain a living environment that is consistent with the City's vision and guiding principles.
12. Promote higher density housing in the mixed-use area of the City.

13. Explore innovative approaches to zoning and development that seek to achieve the goals and policies outlined in the plan such as the idea of "inclusionary zoning."
14. Encourage new technologies and innovations in home building that reduce housing costs, conserve energy and conserve water resources while maintaining a safe and healthy living environment.
15. Encourage affordable housing to be dispersed throughout the community rather than being centralized in one area or neighborhood.

Housing Action Steps

This plan identifies some of the important challenges Inver Grove Heights will face over the life of this plan. Those challenges require the City take active steps in order to carry out the vision and policies. The following are actions steps that will be pursued.

A. Conduct a critical review of development regulations and processes to reduce barriers.

Barriers to developing affordable housing can come in many ways. Setting too restrictive standards for lot size and dimensions or building requirements add costs to housing that pushes it beyond the affordability level. Requiring multiple layers of approval delay processes adding administrative costs and increasing risks.

Key components of this action step include:

1. Conduct an inclusive and unbiased process of evaluation including representation from:
   - housing advocacy groups
   - builders association (developers/realtors/builders/lenders)
   - the design profession (architects, inspectors, planners)
   - policy makers and advisors
2. Consider design guidelines that illustrate acceptable means of site design, building materials, facade treatments and site improvements (landscaping.)
3. Design affordable housing in a manner that reflects the surrounding market rate housing.
4. Evaluate financial impacts of various regulatory provisions to ensure affordability can be maintained or preserved. This can include exploration of financial programs and tools that may help in achieving sometimes conflicting objectives (i.e. high design aesthetic vs. maintained affordability.)

The figure above illustrates a blend of affordable housing with market rate housing. 30% of the units are affordable to families at 80% of the average median income. The Kensington Park project is located in the City of Richfield.

B. Conduct an education campaign to help dispel myths of affordable housing and recognize the community benefits.

A significant barrier to overcome is the opposition to affordable housing. This opposition is not new by any means. However, much of it is often driven by strong emotions over the fear of change. This action step should be something embraced by the same representation group as noted in action step A. Substantial resources already exist to undertake an educational program and can be obtained through partnerships with agencies such as ISAIAH, Dakota County CDA, Metropolitan Council and other housing agencies.

C. Prepare a detailed housing action plan.

This plan is a chapter of the Comprehensive Plan that was developed over a year's time which included community wide input sessions. Developing a housing action plan that is dedicated and focused on the topic of housing will be an important tool for the City to better understand the critical housing issues facing the community and the most effective means to address them. Significant data has been assembled through the Comprehensive Planning process as well as through regional housing studies completed by the Dakota County CDA. This will enable the planning effort to focus on solutions.

Transportation

CHAPTER 5

Introduction

The Transportation Element of the Comprehensive Plan of the City of Inver Grove Heights is intended to provide guidance for the development of transportation systems that will meet year 2030 conditions. The plan, upon its adoption by the City, will have gone through a systematic and detailed review process by City staff and by City decision-makers.

This plan addresses the roadway system as well as other transportation modes including transit, and rail. A trails/bikeway element is included in the parks and open space section of the comprehensive plan.

The plan, functioning as a guide, requires periodic updating in order to reflect and react to potential changes in transportation conditions and technology, as well as major land use changes that could occur in the future.

Transportation Policy Plan

In 2004, the Metropolitan Council prepared the 2030 Transportation Policy Plan (TPP) to support its 2030 Regional Development Framework (see sidebar). The TPP contains a number of transportation policies and strategies intended to guide the development of the regional transportation system. Policy Number 18 states that local comprehensive plans must be consistent with the TPP. The philosophy and focus of the TPP is summarized in the following points:

- Plan and invest in multi-modal transportation choices based on the full range of costs and benefits.

2030 Regional Transportation Policy Plan

The Transportation Policy Plan incorporates the transportation policies and plans that support the Metropolitan Council's Regional Development Framework and describes the Council's approach to investments between now and 2030. This is the tenth update of the regional transportation plan first adopted by the Council in 1971 and represents the fifth decade of coordinated efforts in planning and implementing this region's metropolitan urban transportation system. It replaces the 2001 Regional Transportation Policy Plan.

- Make more efficient use of the regional transportation system.
- Encourage travel demand management strategies, including flexible work hours and telecommuting.
- Focus highway investments first on maintaining and managing the existing system, and second on slowing the growth of congestion.
- Encourage local communities to implement a system of fully interconnected arterial and local streets, pathways, and bikeways.
- Promote the development and preservation of various freight modes.
- Support airport facilities investments.
- Serve the region's economic needs.

When considering the local context of the transportation plan, a series of goals that are important to the provisions of an efficient transportation system should be considered. These goals are listed below:

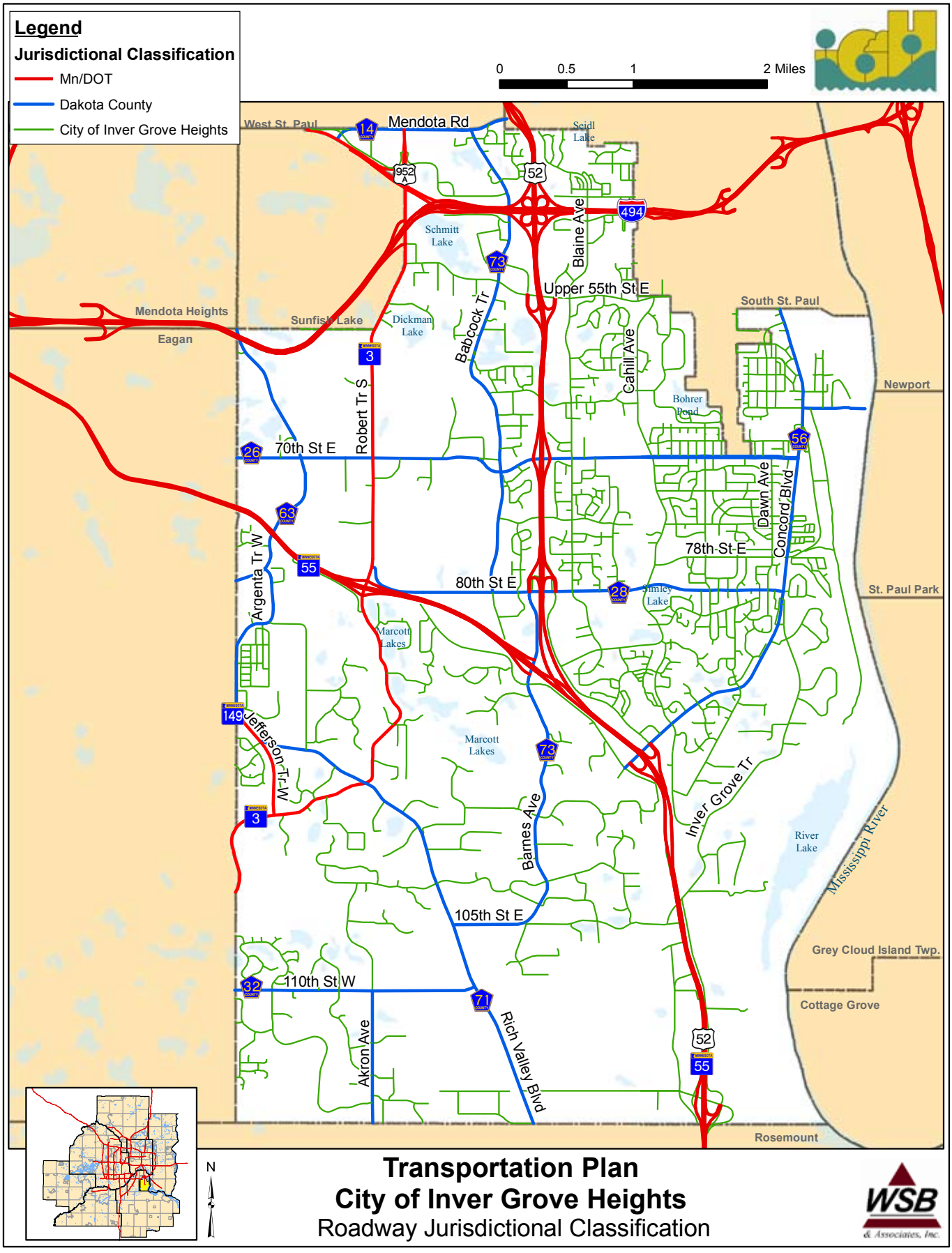
- Provide a transportation system that serves the access and mobility needs of the City.
- Provide a safe and efficient transportation system that is cost effective.
- Ensure that the transportation system is implemented in an environmentally sensitive manner.
- Provide a coordinated transportation system with respect to regional and adjoining municipalities' plans.
- Provide a transportation system that supports multi-modal transportation whenever and wherever feasible and advantageous.
- Provide a transportation system that reflects the values and goals of the residents of Inver Grove Heights.
- Provide and support a transportation system that enhances quality economic development within the City.

Existing Conditions

Roadway Jurisdiction

Roadways are classified on the basis of which level of government owns and has jurisdiction over them. In the case of Inver Grove Heights, roadways are under the jurisdiction of Mn/DOT, Dakota County or the City. Figure 5-1 depicts the existing roadway jurisdictional classification system in Inver Grove Heights.

Figure 5.1: Jurisdictional Classification



Metropolitan Council - Functional Classification

For arterial roadways, the Metropolitan Council has designation authority. Local agencies may request that their roadways become arterials (or are downgraded from arterial to collector), but such designations or re-designations must be approved by the Metropolitan Council.

Functional Classification

The functional classification system is a roadway and street network that distributes traffic from neighborhood streets to collector roadways, then to arterials and ultimately the Metropolitan Highway System. Roads are placed into categories based on the degree to which they provide access to adjacent land versus providing higher-speed mobility for "through" traffic. Functional classification is a traditional cornerstone of transportation planning. Within this approach, roads are located and designed to perform their designated function.

The current roadway functional classification map for Inver Grove Heights is presented as Figure 5-2. It can be seen that the roadway system presently consists of five functional roadway classifications.

- Principal Arterial
- A Minor Arterial
- Community (major) Collector
- Neighborhood (minor) Collector
- Local Street

Right-of-Way Needs

The roadway rights-of-way and roadway widths will vary given the function of the facility. The right-of-way ranges are as summarized in Table 5-1, below:

Table 5-1 General Right-of-Way Requirements

Roadway Capacity

Functional Classification	Right-of-Way Range
Principal Arterial	100-300 feet
Minor Arterial	60-150 feet
Collector	60-100 feet
Local	50-80 feet

As a part of this transportation plan analysis, an inventory of the roadway system was conducted in order to view certain operational characteristics and to note the number of travel lanes on the roadways. The number of lanes for the primary roadway facilities in Inver Grove Heights are shown on Figure 5-3. That graphic is not intended to illustrate the available lanes at intersections (where exclusive turn lanes may or may not exist), but rather to provide an overall view of available lanes for through traffic on the roadway segments.

Figure 5.2: Functional Classification

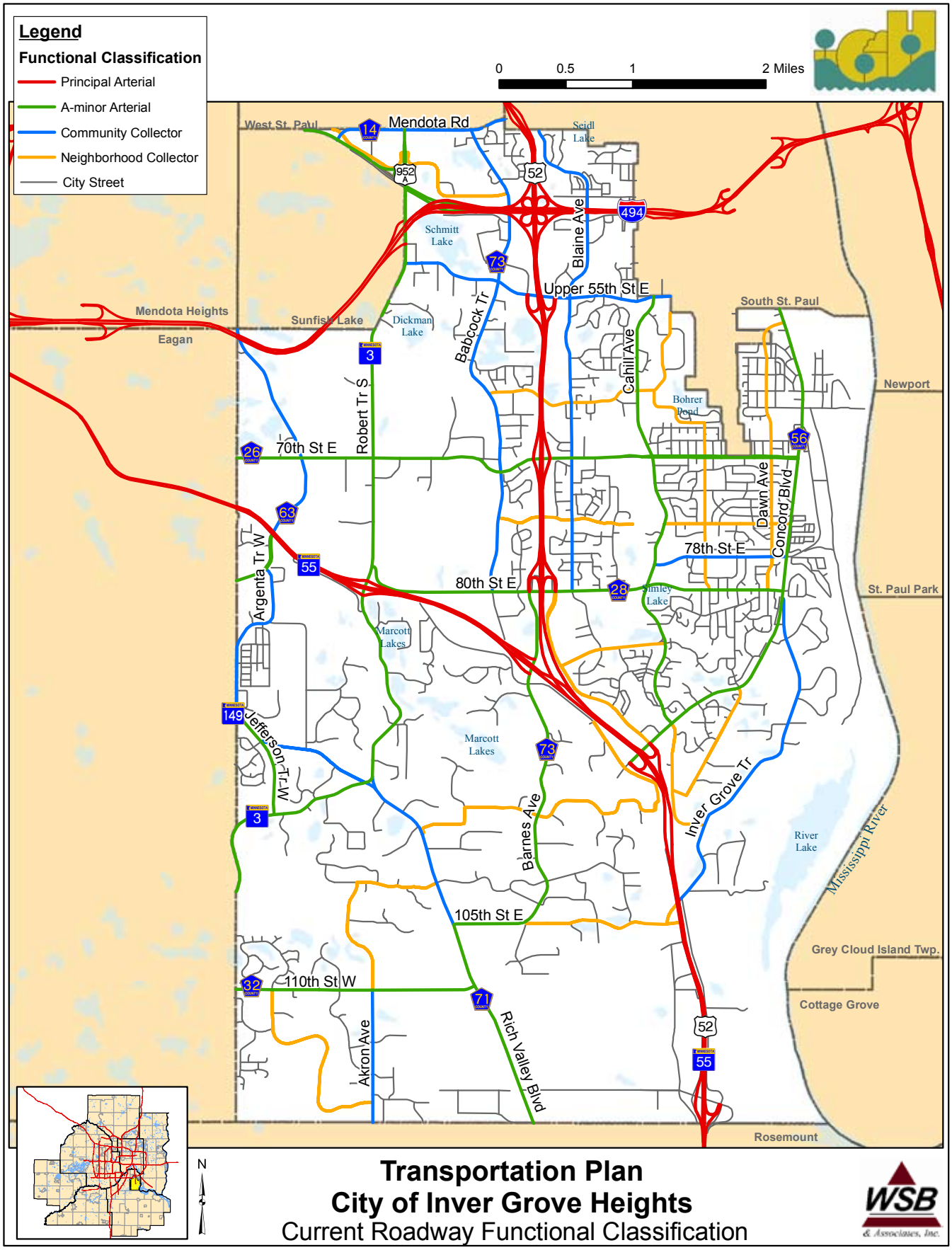
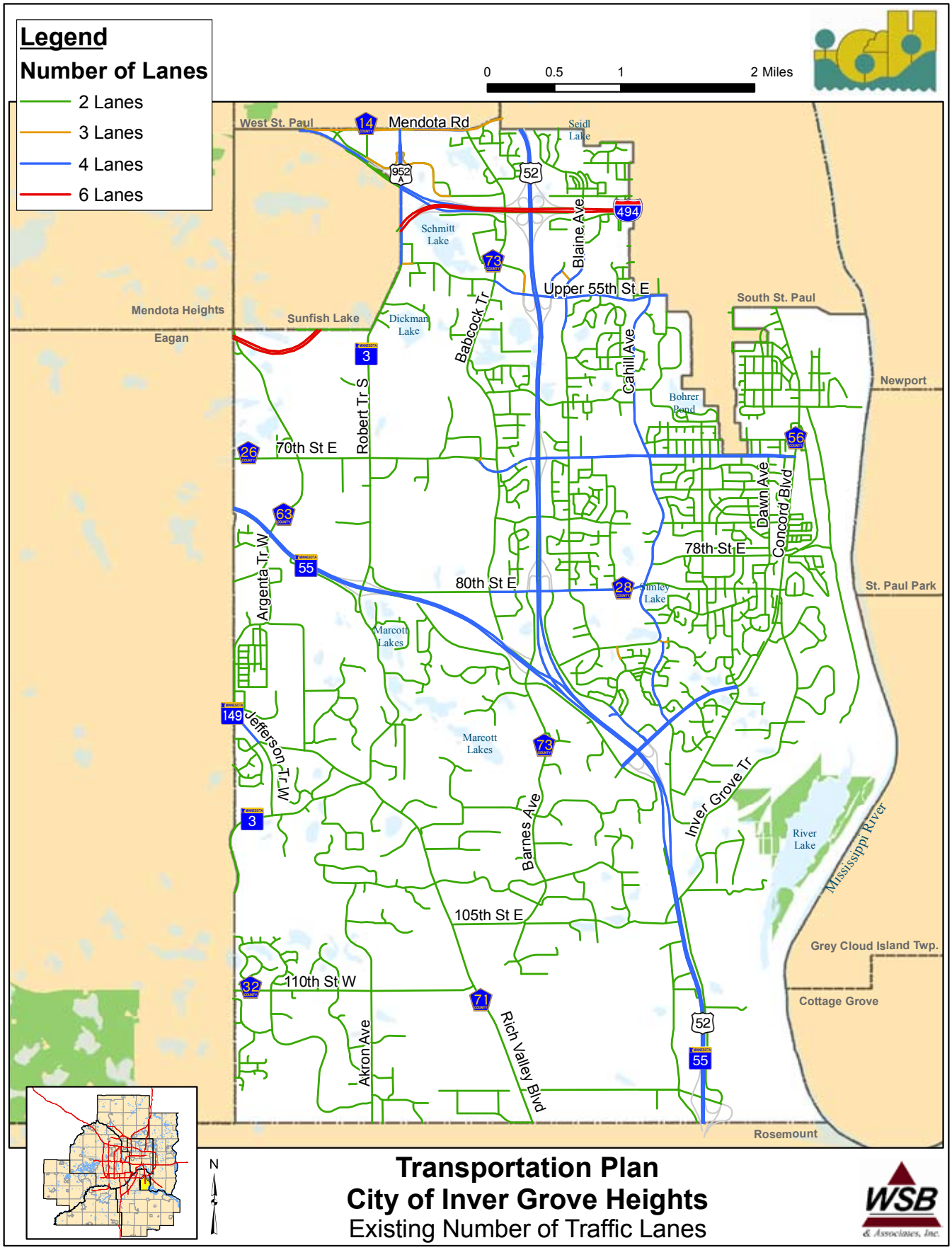


Figure 5.3: Number of Lanes



Level of Service

In general, the capacity of a roadway is a measure of its ability to accommodate a certain volume of moving vehicles. Level of service (LOS) refers to a quantitative comparison between an existing traffic volume and the maximum volume of traffic the roadway can accommodate given its lane configuration (see Table 5-2). Based on the ratio between existing traffic volumes and roadway capacity, a level of service from A – F is assigned. LOS D is widely considered an acceptable level of delay in a metropolitan area for planning purposes. LOS E and F conditions generally require mitigation measures such as added lane capacity, improved access management, or localized intersection improvements. As a long term planning document, this chapter will address capacity improvement needs (number of traffic lanes). This approach is consistent with Metropolitan Council guidelines for 2030 comprehensive plans.

Table 5-2: Generalized Roadway Capacities – Level of Service[1]

	Level of Service (upper capacity limits – vehicles per day)			
Facility Type	A-C	D[2]	E	F
2-Lane Urban	9,000	11,000	13,000	>13,000
2-Lane Rural	12,000	15,000	18,000	>18,000
3-Lane	14,000	18,000	22,000	>22,000
4-Lane Undivided	19,000	24,000	29,000	>29,000
4-Lane Divided	29,000	36,000	43,000	>43,000
4-Lane Expressway	34,000	42,000	50,000	>50,000
6-Lane Expressway	50,000	63,000	76,000	>76,000
4-Lane Freeway	56,000	70,000	84,000	>84,000
6-Lane Freeway	84,000	105,000	126,000	>126,000

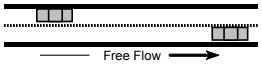
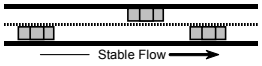
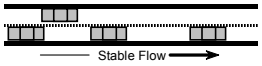
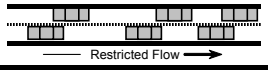
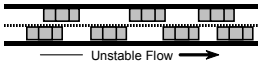
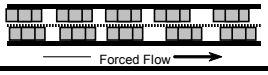
[1] These generalized thresholds are based on a variety of sources, including the Highway Capacity Manual (HCM) and the Metropolitan Council Regional Model. Actual operational thresholds can be affected by a range of factors such as access spacing, traffic signal spacing, and topography.
[2]The upper LOS D limit is generally considered the highest acceptable volume and associated congestion level for roadways in metropolitan areas such as the Twin Cities.

Expressway (i.e. TH 55/52) - A multilane highway that provides a high level of mobility from a regional level. Access is controlled by at-grade interchanges and partial or full grade separation.

Freeway (i.e. I-494) - A multilane highway that provides the highest level of mobility from a regional level. Access is controlled by grade separations.

Table 5-3 below displays the level of service categories, approximate volume-to-capacity (V/C) ratios, and a general description of the traffic operations. In accordance with Minnesota Department of Transportation guidelines, the traffic level analysis uses the LOS D/E boundary as the indicator of acceptable traffic operations and congestion. LOS D (approaching capacity) is generally considered an acceptable operating condition during peak hours in urban areas such as the Twin Cities.

Table 5-3: Level of Service & Volume Capacity

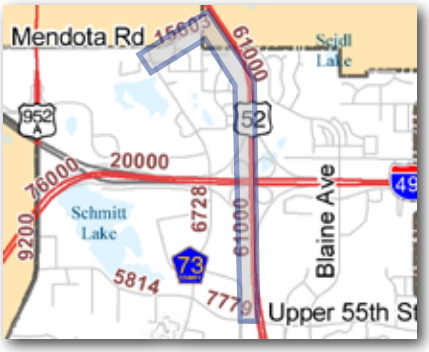
Level of Service	Volume/Capacity (V/C) Ratio	Traffic Flow	Description
A	0.00 to 0.39		**FREE FLOW** Low volumes and no delays.
B	0.40 to 0.59		**STABLE FLOW** Low volumes and speeds dictated by travel conditions.
C	0.60 to 0.79		**STABLE FLOW** Speeds and maneuverability closely controlled due to higher volumes.
D	0.80 to 0.99		**RESTRICTED FLOW** Higher density traffic restricts maneuverability and volumes approaching capacity.
E	1.00 to 1.19		**UNSTABLE FLOW** Low speeds, considerable delays, and volumes at or slightly over capacity.
F	1.20 and above		**FORCED FLOW** Very low speeds, volumes exceed capacity, and long delays with stop-and-go traffic.

SOURCE: Highway Capacity Manual and WSB & Associates, Inc.

K:\01464-07\Admin\Docs\Report\[tables.xls]Fun_Class Tables

Traffic Volumes

Existing traffic volumes are used to determine the ability of the roadways to function as intended. The levels of traffic along a roadway, along with the available lanes on which traffic operates, are the primary determinants for calculating the levels of service of a roadway facility. The most current average daily traffic volume data available from Mn/DOT is provided on Figure 5-4.



The only two roadway segments in Inver Grove Heights that register a level of service worse than LOS C are along Mendota Road and the northern portions of TH 52

Based on a review of existing traffic volumes against capacities of roadway segments in Inver Grove Heights, there are only two segments that are worse than LOS C:

- TH 52 from the northern City limit to Upper 55th Street – LOS D
- Mendota Road (CSAH 14) between Babcock Trail (CSAH 73) and TH 52 – LOS D

Figure 5.4: 2006 Average Daily Traffic Volumes

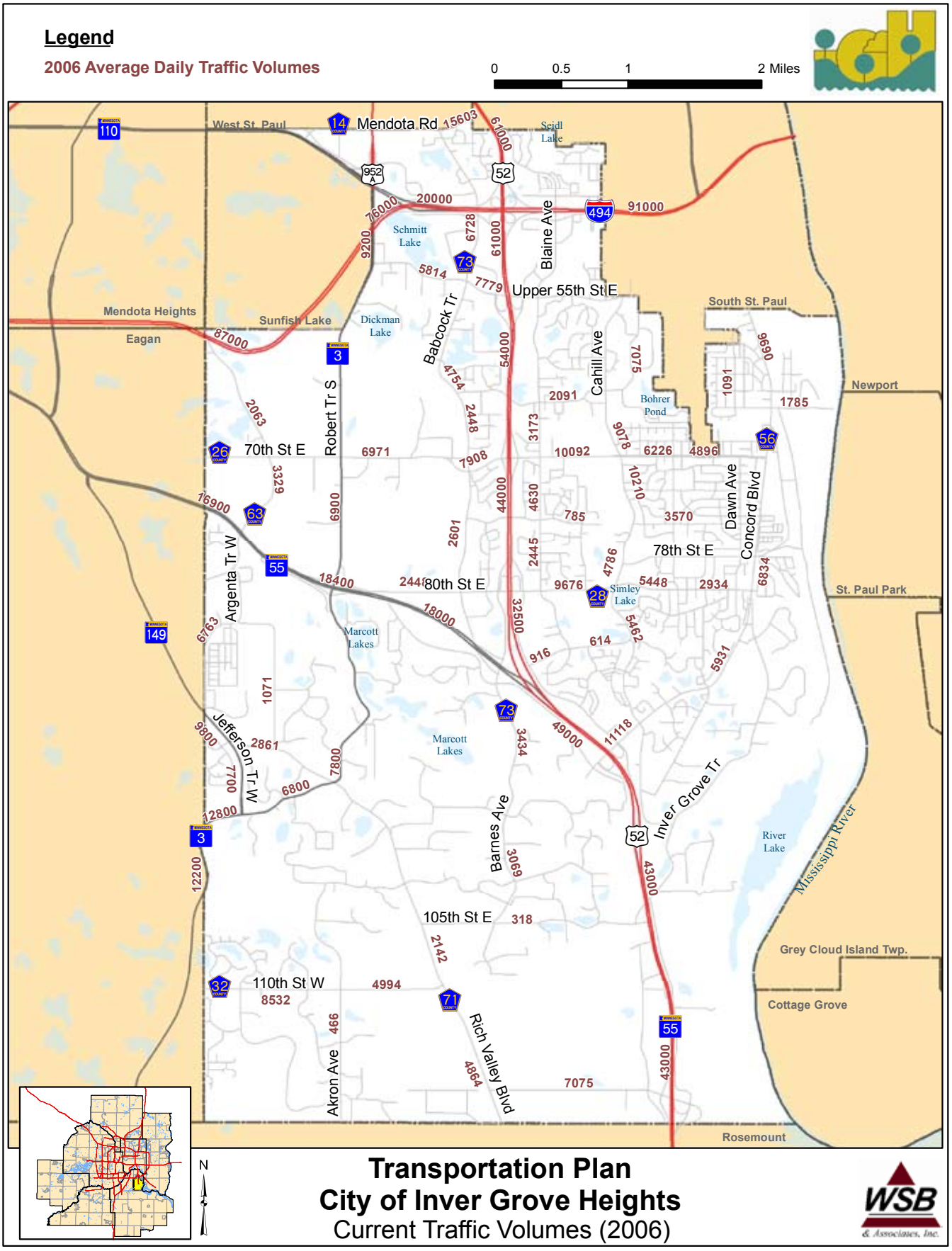


Figure 5.5: Number of Crashes

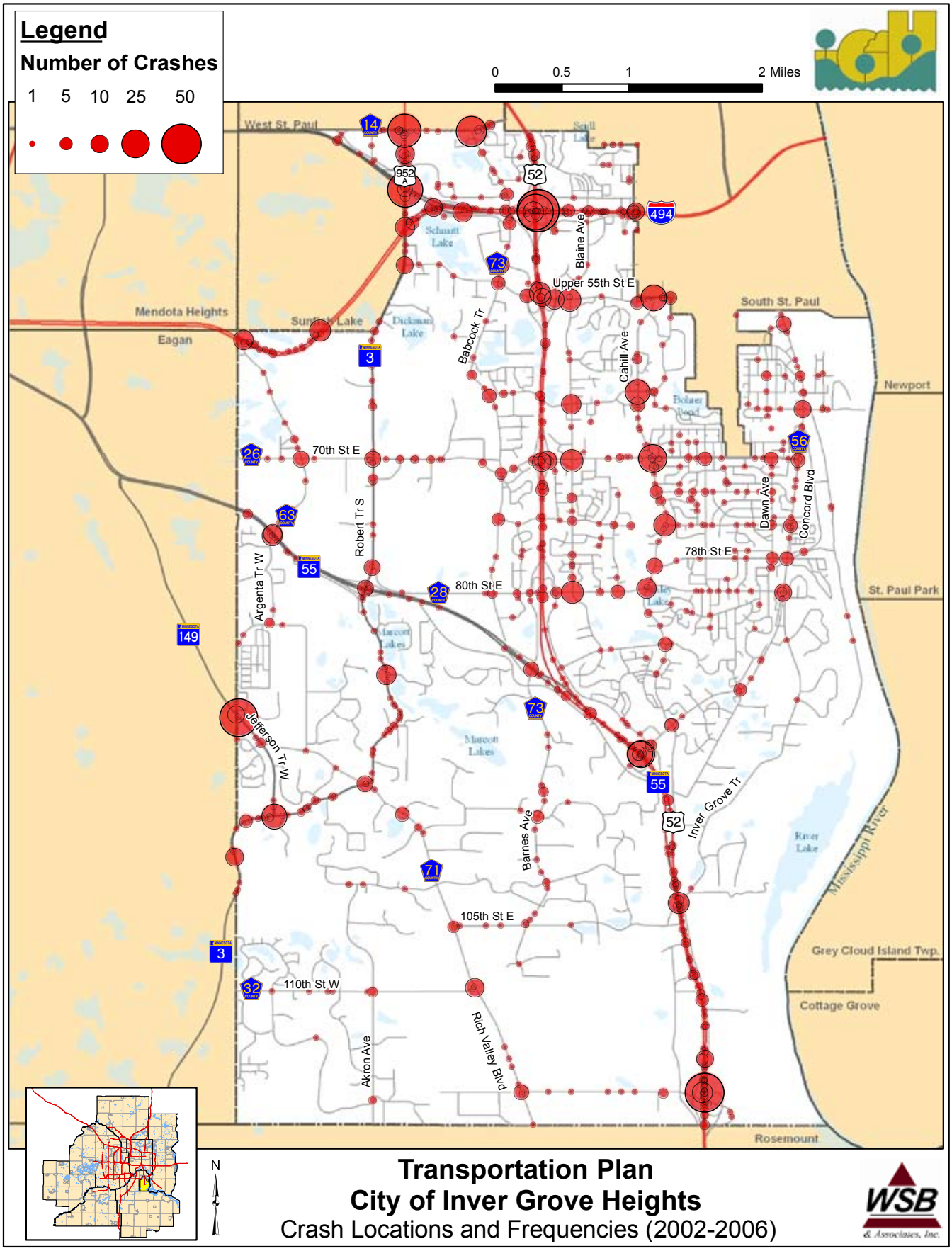
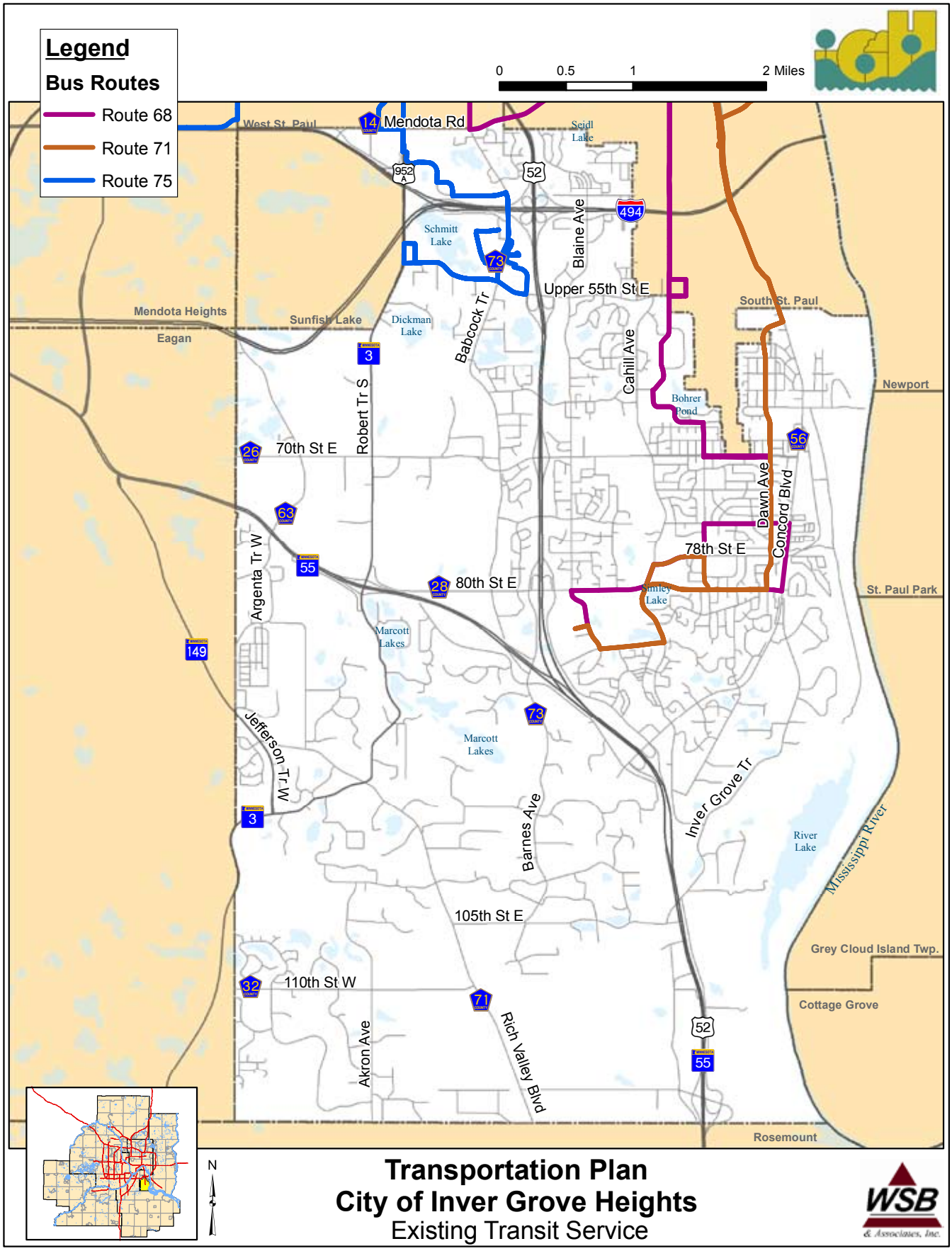


Figure 5.6: Transit System



Safety

Figure 5-5 presents the locations and frequencies of crashes based on Mn/DOT crash data for the period 2002 – 2006. Mn/DOT data files allow individual intersections, areas, or corridors to be analyzed in detail. For each given study area, crashes can be sorted and analyzed in terms of severity and type as well as other factors.

Transit

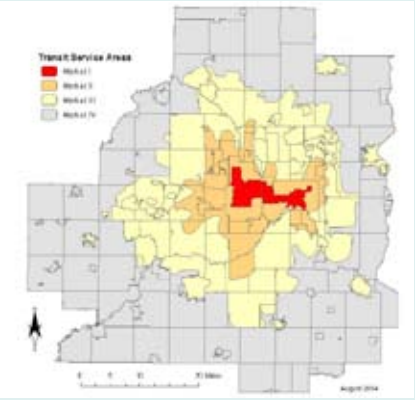
Scheduled Transit service in Inver Grove Heights is provided by Metro Transit, a Division of the Metropolitan Council. Current service routes are depicted on Figure 5-6. The current routes are 68, 71, and 75. They are urban local routes with all-day and evening service into downtown St. Paul. Routes 68 and 71 have weekend service and continue their routes north to Maplewood. There currently are no park-and-ride facilities in Inver Grove Heights.

Paratransit, or "dial-a-ride" transit services are also provided for Inver Grove Heights residents. These are services for those unable to drive or use scheduled transit. Individuals call ahead to reserve rides for medical visits, shopping, and other needs. In Inver Grove Heights, these services are provided by Metro Mobility and Dakota Area Resources and Transportation Services for Seniors (DARTS).

Rail Service

There are rail lines located in the eastern and southern sections of Inver Grove Heights. The trackage in the southeast part of the City accommodates seven trains per day. The trackage running parallel to Concord Boulevard in the vicinity of 71st and 65th Streets carries 15 trains per day.

Metropolitan Council - Transit Market Areas



IGH is located in 3 of the 4 Transit Market Areas. Market area II is located north of I-494. Central IGH falls within Market Area III and southern IGH is located in Market Area IV.

Market Area I - Highest concentrations of activity, housing & jobs. Service options include: Regular-route locals, all-day express, special needs paratransit, ridesharing.

Market Area II - Moderate concentrations of jobs, housing and activities. Service options include: Regular-route locals, all-day express, small vehicle circulators, special needs paratransit, ridesharing.

Market Area III - Generally lower concentrations with intermittent pockets of moderate concentrations. Service options include: Peak-only express small-vehicle circulators, special needs paratransit, ridesharing.

Market Area IV - Lowest concentrations of housing and jobs. Service options include: Dial-a-ride, volunteer driver programs, ridesharing.

Future Transportation Needs

The transportation system will continue to play a significant part of our daily lives. However, the future of our system will continue to be put to the test. By 2030, the seven county metropolitan area is expected to add a million new residents. This growth will continue to add more demand for roadway improvements. It is unlikely that future roadways alone will be able to meet the regional demand for mobility. A more likely future transportation system will include a combination of maintenance, preservation, alternative modes of transportation and behavioral changes to reduce congestion. These strategies can be achieved through two types of management programs: 1) Transportation System Management (TSM) and 2) Transportation Demand Management (TDM).

Transportation System Management (TSM)

- Maintaining and up keep of the existing transportation system
- Preservation of right-of-way for future roadway improvements
- Monitoring system performances, such as traffic volumes and levels of services (LOS)
- Access Management
- Intersection and signal improvements

Transportation Demand Management (TDM)

- Encourage change in individual travel behavior that results in single occupancy vehicle trips
- Consider alternative modes of transportation, i.e. Light Rail Transit, Bus Routes, Bike Lanes, Car Pools, Van Pools & Park-and-Ride Lots
- Encourage urban land use patterns that accommodates alternative modes of transportation, such as Transit Oriented Development (TOD)
- Encourage flex work hours or off peak shift changes at major employers
- Coordinate or encourage the organization of Transportation Management Associations (TMA)

In order to implement these tools there needs to be a fair balance between land use patterns and the transportation system. The intent of the following section is to determine future transportation needs within the context of future land use patterns.

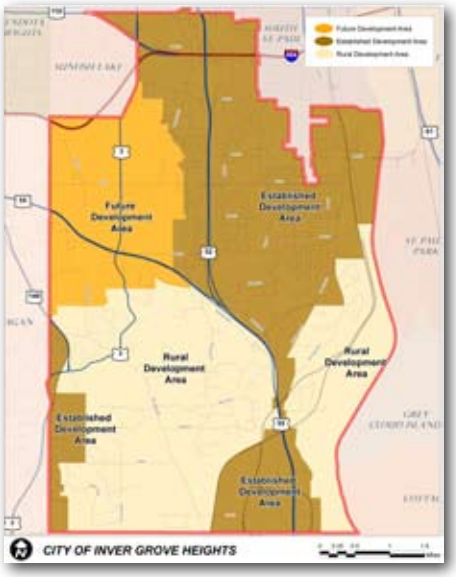
Future Mississippi River Crossing

A future river crossing has been discussed as a potential need to facilitate east-west traffic. The City encourages future planning discussions with affected counties and municipalities.

Transportation Management Association

A group of two or more employers established under conditions, covenants, and restrictions provisions to provide a comprehensive and coordinated trip reduction program.

~ American Planning Association (APA)



Development Policy Areas

Future Roadway Assumptions & Deficiency Analysis

ASSUMED 2030 BASELINE CONDITIONS

In order to determine future transportation needs, several assumptions need to be made on how the City will develop over the next 20 years. The land use plan provides this foundation. In addition, the land use plan provides policy direction on how specific areas of the community will develop over time. These policy areas have been broken into three distinctive areas: 1) Future Development Area, 2) Established Development Area and 3) Rural Development Area. The Transportation Chapter identifies a series of transportation improvements associated with each of these areas. They are illustrated on Figure 5.7 and grouped into the following categories:

1. *Programmed Improvements* – Programmed improvements have already been identified in the City's or County's Capital Improvement Program (CIP). Funding has been secured for these projects, and they will be constructed within the next five years (see Table 5-4).

Roadway Improvements

The Transportation Chapter has identified a series of transportation improvements, grouped into three categories (Programmed, Planned & Recommended. Not all of the improvements shown on the City's plans are identified in the County's Transportation Plan, though the County has identified these areas for study.

Programmed – Programmed improvements have already been committed and identified in the City's or County's Capital Improvement Program (CIP). Funding has been secured for these projects, and they will be constructed within the next five years.

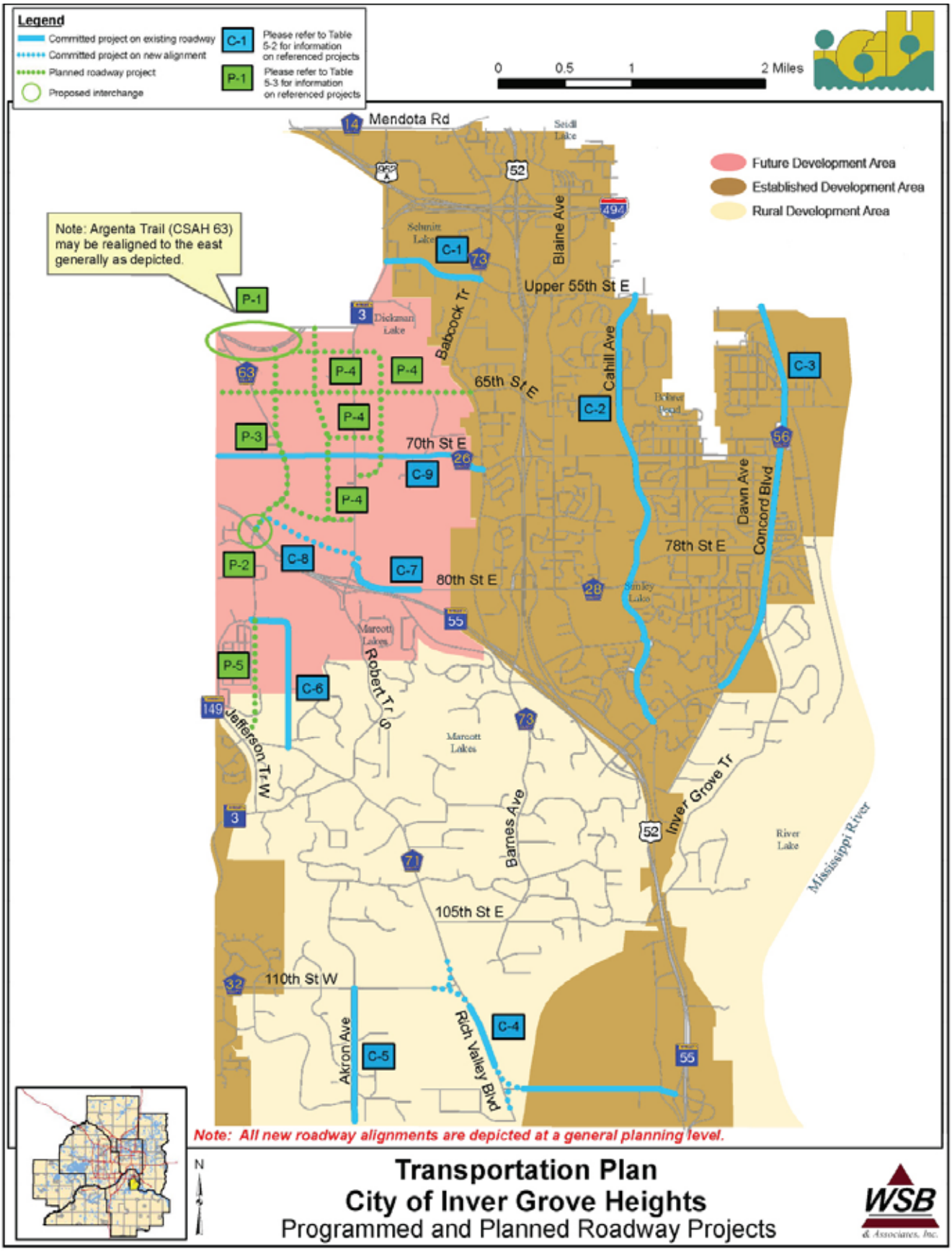
Planned – Planned improvements have been discussed between agencies and/or identified in previous transportation planning documents. A funding source has not been established at this time. The City assumes that these projects will receive funding and will be implemented prior to 2030

Recommended –Recommended improvements are projected to be required over and above programmed and planned improvements, as defined above, to meet future conditions. The need for these projects is based primarily on future roadway deficiency analysis (Level of Service) conducted as part of the 2030 comprehensive planning process.

Table 5-4: Programmed Transportation Improvement

Figure 5-7 ID Number	Roadway/Facility	Location	Primary Improvement	Lead Agency
C-1	Upper 55th Street	Robert Tr. To Babcock Tr.	2-lane to 4-lane	City of IGH
C-2	Cahill Avenue	upper 55th Street to Concord Boulevard	Combination of restriping from 4-lane to 3-lane, widening at intersections, intersection control (Upper 55th St. and 65th St.)	City of IGH
C-3	Concord Boulevard	Corcoran Path to north of City limit	2-lane to 3-lane	Dakota County
C-4	Cliff Rd. (CSAH 32)/ Rich Valley Blvd (CSAH 71)/117th St.	Cliff Rd./Rich Valley Blvd. to 117th St.	Reconstruct for east-west continuity	Dakota County
C-5	Akron Avenue (CSAH 73)	Cliff Road to Rosemount	Gravel to paved 2-lane (rural section)	Dakota County
C-6	Alverno Avenue	Argenta Tr. to Rich Valley Blvd.	Gravel to paved 2-lane (urban section)	City of IGH
C-7	80th Street (CSAH 28)	Robert Tr. to 0.6 mile east of Robert Tr.	Upgrade roadway to 2-lane divided	Dakota County
C-8	80th St. (CSAH 28)	Robert Tr. to Argenta Tr.	New roadway to support future development	Dakota County
C-9	70th St. (CSAH 26)	Eagan to Babcock Tr.	2-lane to 4-lane divided	Dakota County

Figure 5.7: Programmed and Planned Roadway Projects



2. *Planned Improvements* – Planned improvements have been discussed between agencies and/or identified in previous transportation planning documents. However, a founding source has not been established at this time. The City assumes that these projects will receive funding and be implemented prior to 2030. A summary of each planned improvement is provided in Table 5-5 and is followed by more detailed background discussion for each planned improvement..

Table 5-5: Planned Transportation Improvements

Figure 5-7 ID Number	Roadway/Facility	Location	Primary Improvement	Lead Agency
P-1	I-494/Argenta (CSAH 63)	I-494/Argenta (CSAH 63)	Interchange	Dakota County
P-2	TH 55/80th St./ Yankee Doodle Road (CSAH 28)	TH 55/80th St./ Yankee Doodle Road (CSAH 28)	Interchange	Dakota County
P-3	Argenta (CSAH 63)	Between I-494 and TH 55	4-Lane divided and realignment	Dakota County & City of IGH
P-4	Collector roadway network	Northwest AUAR area	New roadways to support NW development	City of IGH *
P-5	Jefferson - Argenta (CSAH 63) Connector	Between Jefferson Trail (TH 149) and east of Argenta Trail (CSAH 63)	New roadway	Dakota County

* *With significant financial commitment from private developers.*

I-494/Argenta Trail Interchange

Regional development and local development pressures contributes to the need for a future interchange at I-494 and the Argenta Trail area.

It is acknowledged that a new interchange is a departure from the Transportation Policy Plan (TPP). It is the intent of this plan to lay the foundation for under taking the necessary process to bring our plan and the regional system plan into consistency.

I-494/Argenta Trail (CSAH 63) Interchange - This interchange was included in the City's 2020 Transportation Plan. CSAH 63 may be realigned to the east as depicted on Figure 5-8. As identified in a travel demand study conducted by Dakota County, there is a growing demand for north-south regional connectivity in the central portion of the County. Increasing development to the south in communities such as Rosemount, Farmington, and Northfield will increase through-traffic on TH 3 and TH 149. Given sufficient capacity and connectivity, these roadways could serve as "surrogate principal arterials" in this portion of the County and the metro region as identified in the County's travel demand study.

In addition to the projected increased regional demand, extensive development is anticipated in northwest Inver Grove Heights. The Dakota County travel demand study projected that development within the NW Area will combine to generate approximately 200,000 trips per day when fully developed. The NW Area does not have convenient access to the north-south principal arterials in the study area, I-35E to the west, and TH 52 to the east.

As identified in Dakota County's travel demand study, an interchange in the vicinity of CSAH 63 and I-494 would provide relief to the I-494/TH 149 interchange, which is anticipated to be over capacity by 2030. It would also reduce traffic volumes on TH 3 south of I-494, which is also anticipated to be over capacity by 2030. Mostly it provides needed access to anticipated development in northwest Inver Grove Heights and Northeast Eagan.

The development of a new interchange at I-494/CSAH 63 would be a substantial undertaking requiring further study and coordination between Inver Grove Heights, Eagan, Mendota Heights, Sunfish Lake, Dakota County, and Mn/DOT. One of the design issues to be addressed is the possibility of realigning CSAH 63 to the east as depicted on Figure 5.8. This realignment was identified in the 2020 Inver Grove Heights transportation plan and would mean that the interchange would be east of the current CSAH 63 bridge over I-494. The City will continue to coordinate with other agencies to advance this project. Implementation requirements are further addressed under the Future Roadway Needs heading later in this section.

TH 55/CSAH 63/CSAH 28 Interchange - This interchange was included in the City's 2020 Transportation Plan. It would connect the programmed westerly extension of 80th Street (CSAH 28) with Yankee Doodle Road (also CSAH 28), with grade separated connections to TH 55 and Argenta Trail (CSAH 63). As identified in Dakota County's North-South Corridor Travel Demand Study, this interchange would improve the corridor characteristics of CSAH 63 as a north-south route linking ultimately to I-494 at the north. It would also be needed for east-west access and connectivity, allowing CSAH 28 to function better as a regional roadway. Implementation requirements are further addressed under the Future Roadway Needs heading later in this section.

Northwest Area Collector Roadway Network - The Northwest Area AUAR will require a network of collector level roadways to support anticipated development. Preliminary locations of these roadways are identified on 5.8. Many of these general roadway locations were also identified in the 2020 Inver Grove Heights Transportation Plan. Important factors that will need to be addressed in the further planning, design, and construction of this collector roadway network include hilly topography and wetlands in the area. The City is in the process of refining alignment concepts, evaluating environmental impacts, construction requirements, and cost considerations.

Argenta Trail Improvements - With the assumed Argenta Trail (CSAH 63) interchanges with TH 55 and I-494 as discussed above, Argenta Trail will need to be

Northwest Area Roadway Network

A local-roadway network illustrated in the NW area to emphasize system connectivity, allowing localized trips to stay off regional corridors.

The lines on this map are not intended to reflect actual or preferred alignments.

Figure 5.8: NW Area Roadway Network

upgraded accordingly. This is currently a narrow 2-lane roadway with significant hills and curves. Based on the linkage of these two interchanges, as well as level of anticipated future development in this part of the City, it is assumed that a 4-lane divided roadway will be required. The traffic forecasts and deficiency analysis addressed under the following heading assume that Argenta Trail will be upgraded to 4-lane divided by 2030. Significant analysis will be required to determine the best alignment for this improved roadway. Since this is a County roadway, the City will coordinate closely with Dakota County regarding the analysis of alternatives, preliminary design, and funding issues.

As discussed above, it is assumed that CSAH 63 will be expanded to 4-lane divided roadway between TH 55 and I-494. Projected traffic volumes indicate that CSAH 63 will need to be improved to a 4-lane design by 2030 between CSAH 28 (Yankee Doodle Road) and 82nd Street West. It will need to be expanded to a 3-lane from 82nd Street West to TH 149. The City should coordinate with Dakota County regarding this improvement as need develops as dictated by local development and other roadway improvements.

3. Recommended Improvements – Recommended improvements are projected to be required over and above programmed and planned improvements, as defined above, to meet future conditions. The need for these projects is based primarily on future roadway deficiency analysis (Level of Service) conducted as part of the 2030 comprehensive planning process. These improvements are further addressed at various points through the remainder of the transportation chapter.

TRAFFIC FORECAST METHODOLOGY

To prepare 2030 traffic forecasts for this Comprehensive Plan, the modeling/forecasting results from the studies identified above were used as a base. This approach makes use of existing work and promotes consistency between planning documents. The primary source of information for the Northwest Area volumes was the Northwest Expansion Area AUAR because this was a relatively localized, detailed study relative to the other more regional forecasts. The 2030 TAZ information provided in Table 5-7 (see Figure 5-11 for TAZ locations and boundaries) was considered when adjusting traffic projections from the previously-mentioned studies. The Northwest Area AUAR used 2025 as the projection year, so five years of background traffic growth was assumed in the adjusted 2030 volumes for this area. The City-wide 2030 traffic volume projections are presented on Figure 5-11.

2030 DEFICIENCY NEEDS ANALYSIS

A number of transportation studies (which contained future traffic volume projections) have been completed for the City and County:

- Dakota County North-South Corridor Travel Demand Study (2007)
- Northwest Expansion Area Alternative Urban Areawide Review (2005, updated 2007)
- 2025 Dakota County Transportation Plan (2004)
- County State Aide Highway 32 Extension Study

The most significant area planned for future growth is the Future Development Area, which is comprised of the Northwest Area of the City. This area is anticipated to see an extensive amount of development that will result in roadway improvement needs. In 2005, an Alternative Urban Areawide Review (AUAR) was conducted for this area, and in 2007, the AUAR was updated with revised land use assumptions. The Northwest AUAR Area is depicted on Figure 5-9. The assumed new development associated with this area by 2030 is summarized in Table 5-6.

Table 5.6 presents two sets of land use projections. The NW AUAR projections are based on a worst case scenario that assumes full build out by 2030. The 2030 Comprehensive Plan scales back the development assumptions to assume a slower rate of growth through 2030.

Figure 5.9: NW Area is the area anticipated for future development.

Table 5-6: NW Area AUAR Land Use Assumptions

Land Use Type	2007 AUAR	2030 Comprehensive Plan
Low Density Residential	1,068 units	899 units
Low/Mid Density Residential	2,596 units	1,860 units
Medium Density Residential	1,872 units	1,454 units
High Density Residential	783 units	217 units
Mixed Use Residential	685 units	654 units
Mixed Use Commercial	249 KSF	70 KSF
Commercial	1,875 KSF	1,035 KSF
Industrial	1,265 KSF	1,303 KSF
Office	1,327 KSF	1,312 KSF

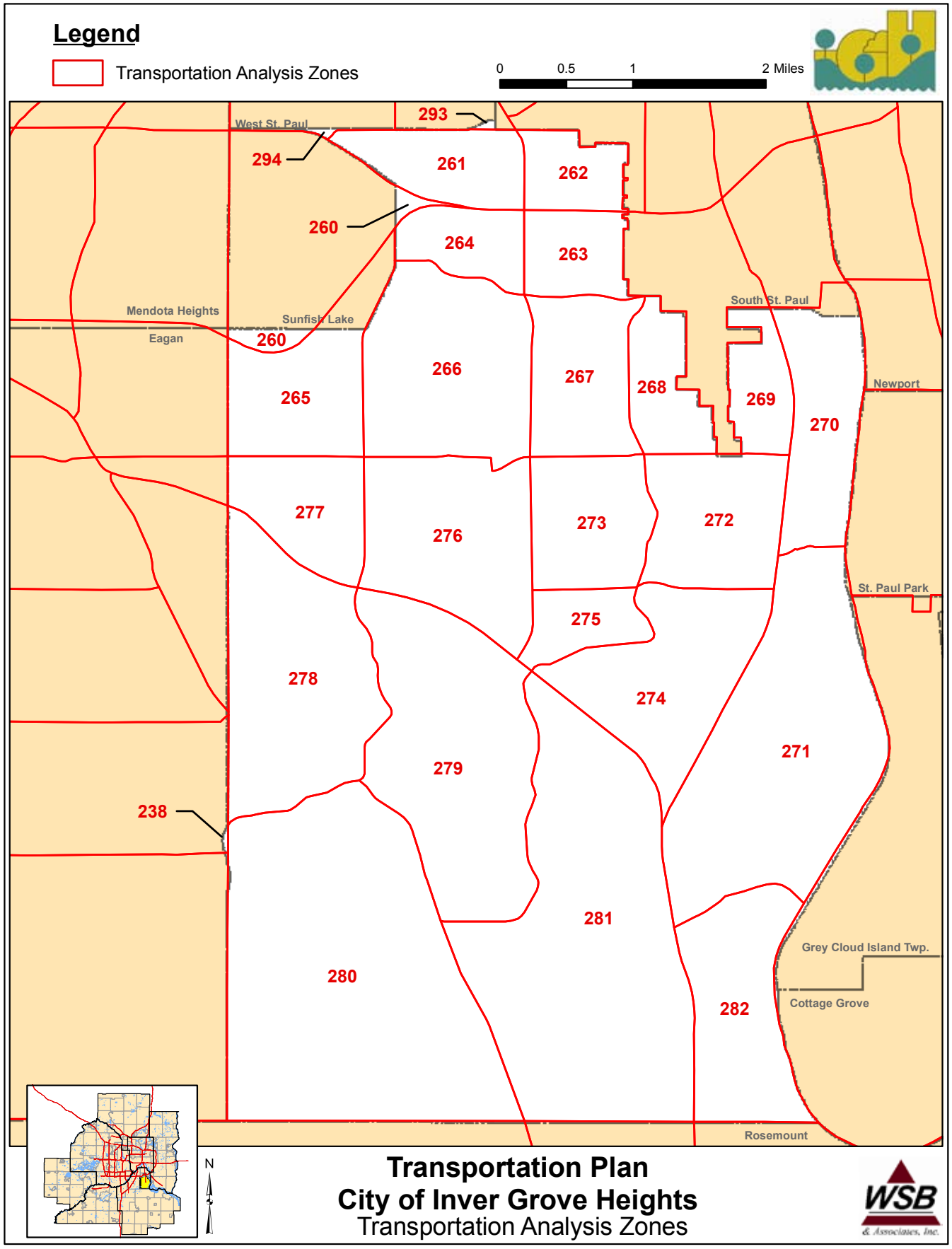
In conjunction with information from the studies listed previously, the TAZ information identified on Table 5-7 was assumed for the 2030 traffic projections. The TAZ zones are depicted on Figure 5-10, and the 2030 volumes are presented on Figure 5-11.

Table 5-7: Traffic Analysis Zones - Population, Households and Employment Forecasts

TAZ #	2000 POP	2010 POP	2020 POP	2030 POP	2000 HH	2010 HH	2020 HH	2030 HH	2000 EMP	2010 EMP	2020 EMP	2030 EMP
260*	10	5	11	11	0	2	5	5	0	0	0	0
261	1,469	1,673	1,650	1,696	691	691	691	691	1,269	1,397	1,397	1,397
262	518	1,851	1,826	1,878	176	765	765	765	4	48	48	48
263	248	1,062	1,099	1,130	148	439	460	460	723	1,009	1,090	1,172
264	2,579	2,878	2,839	2,919	1,189	1,189	1,189	1,189	1,106	1,421	1,421	1,421
265	140	181	1,881	3,513	50	75	788	1,431	0	323	459	1,524
266	1,475	1,875	3,311	4,486	472	775	1,387	1,827	267	354	440	562
267	1,243	1,160	1,182	1,215	474	479	495	495	232	778	984	1,280
268	1,903	2,005	2,014	2,071	813	828	843	843	1,001	1,140	1,183	1,183
269	1,375	1,219	1,251	1,286	469	504	524	524	125	125	130	135
270	786	758	747	768	313	313	313	313	370	370	370	370
271	1,388	1,415	1,453	1,552	503	585	608	632	301	301	301	301
272	5,183	4,465	4,404	4,528	1,842	1,844	1,844	1,844	248	248	248	248
273	2,468	2,257	2,226	2,289	932	932	932	932	196	196	196	196
274	2,330	2,314	2,449	2,518	868	956	1,026	1,026	261	530	653	660
275	1,055	1,445	1,500	1,542	479	597	628	628	797	797	797	797
276	903	3,245	4,783	5,294	292	1,341	2,003	2,156	212	568	830	1,206
277	134	190	1,393	2,095	35	79	583	853	12	701	1,848	2,552
278	1,664	1,507	2,182	4,025	622	623	914	1,640	235	235	393	433
279	751	663	654	692	245	274	274	282	51	553	721	721
280	1,544	1,246	1,229	1,263	440	515	515	515	94	94	276	459
281	572	462	456	469	191	191	191	191	614	667	780	944
282	23	31	31	32	13	13	13	13	50	119	153	256
Total:	**29,761**	**33,909**	**40,571**	**47,275**	**11,257**	**14,007**	**16,992**	**19,257**	**8,168**	**11,973**	**14,721**	**17,863**

(* TAZ 293 & 294 do not include any parcel located within the City Limits of Inver Grove Heights. Only a small portion of TAZ 260 is located within the city)

Figure 5.10: Transportation Analysis Zones



(TAZ 293 & 294 do not include any parcel located within the City Limits of Inver Grove Heights. Only a small portion of TAZ 260 is located within the city)*

Figure 5.11: 2030 Traffic Volumes

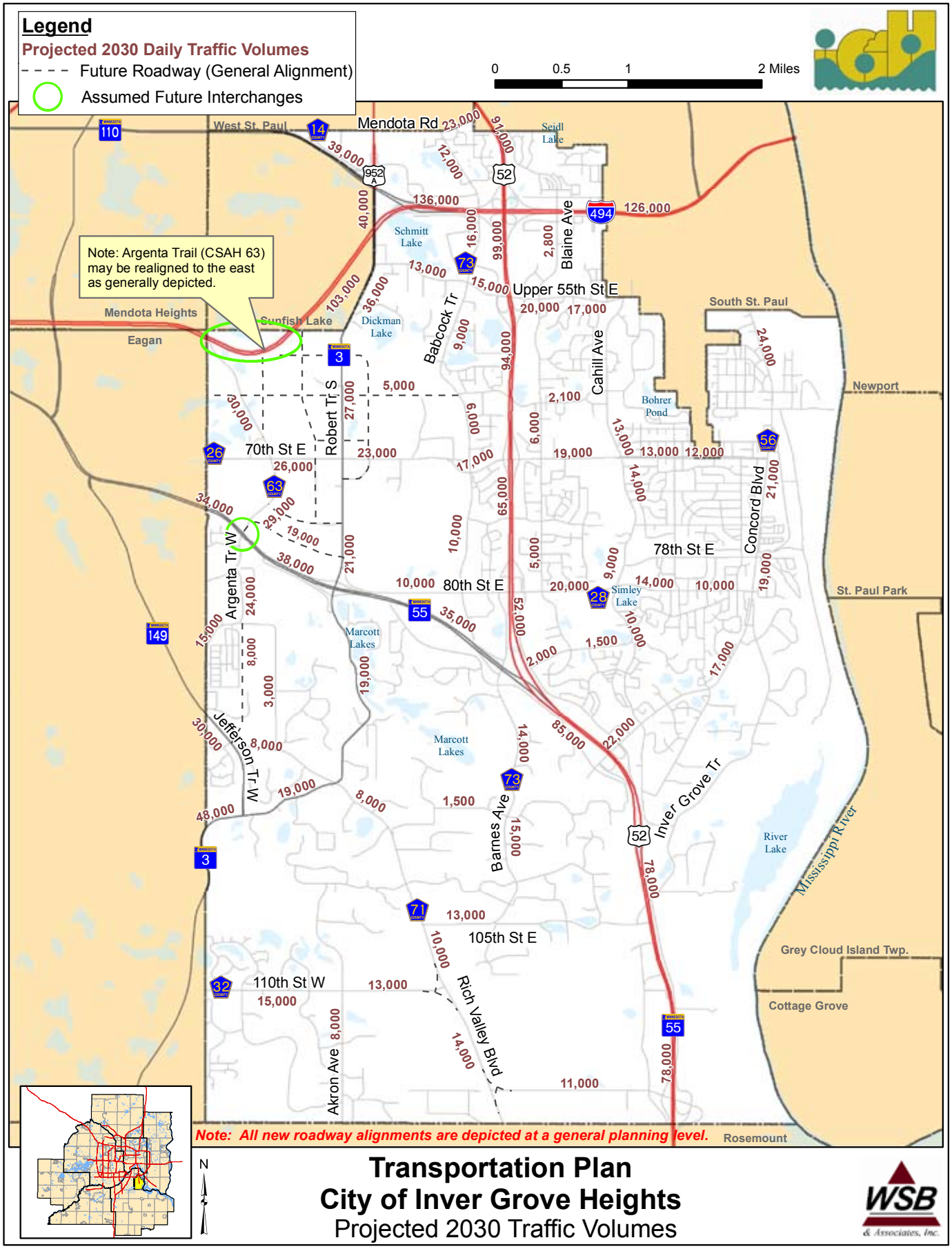


Figure 5.12: 2030 Number of Lanes

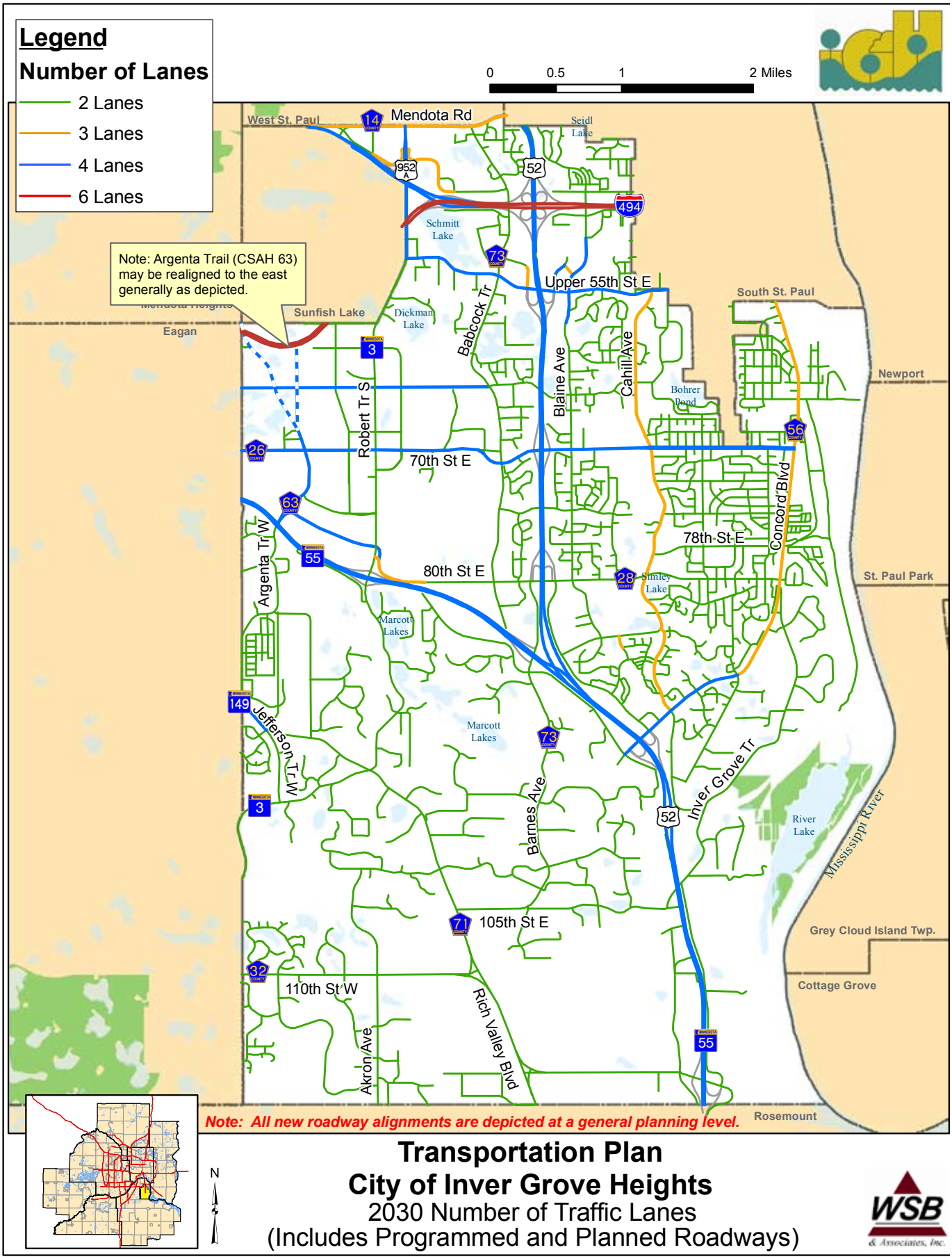


Figure 5.13: 2030 Levels of Service

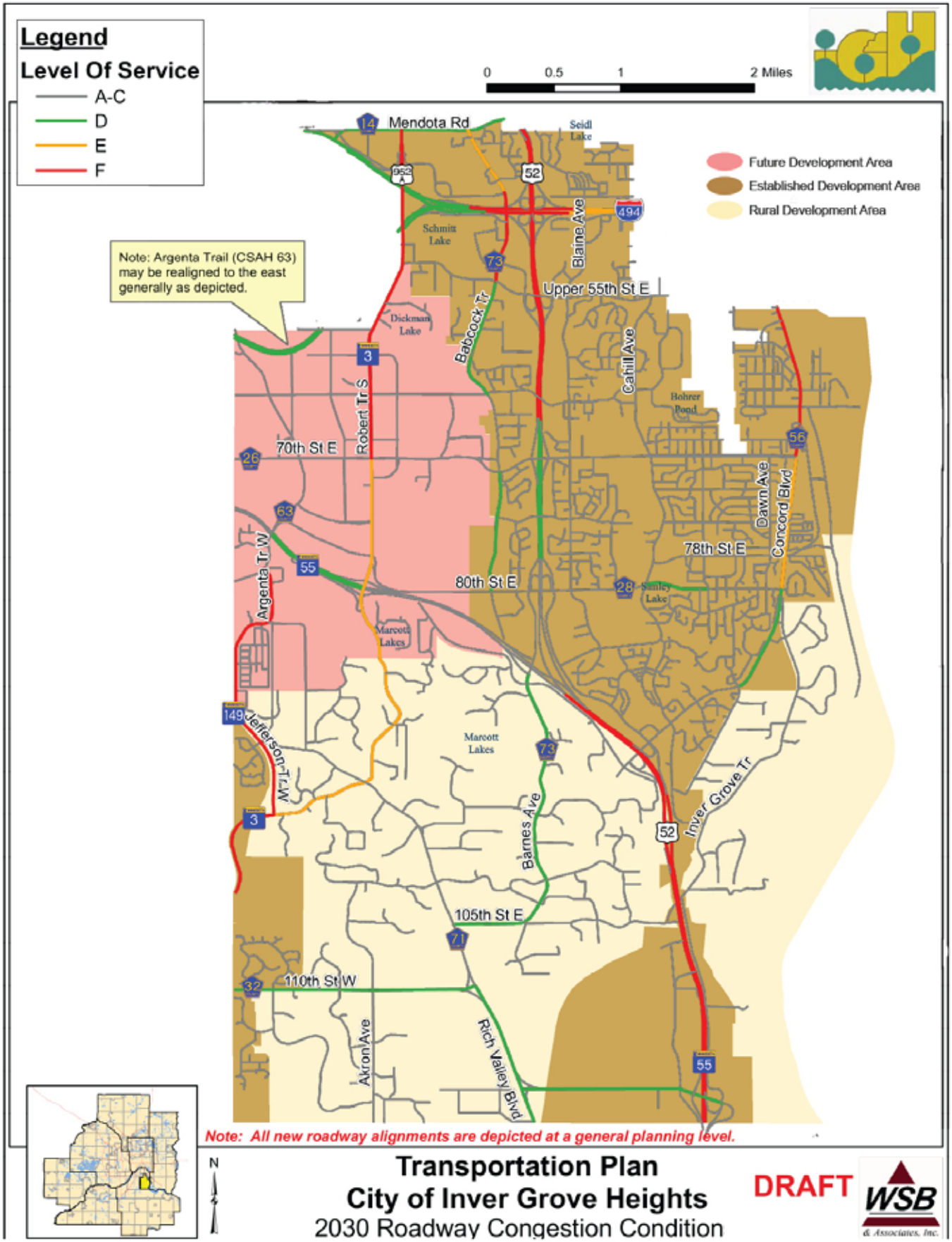
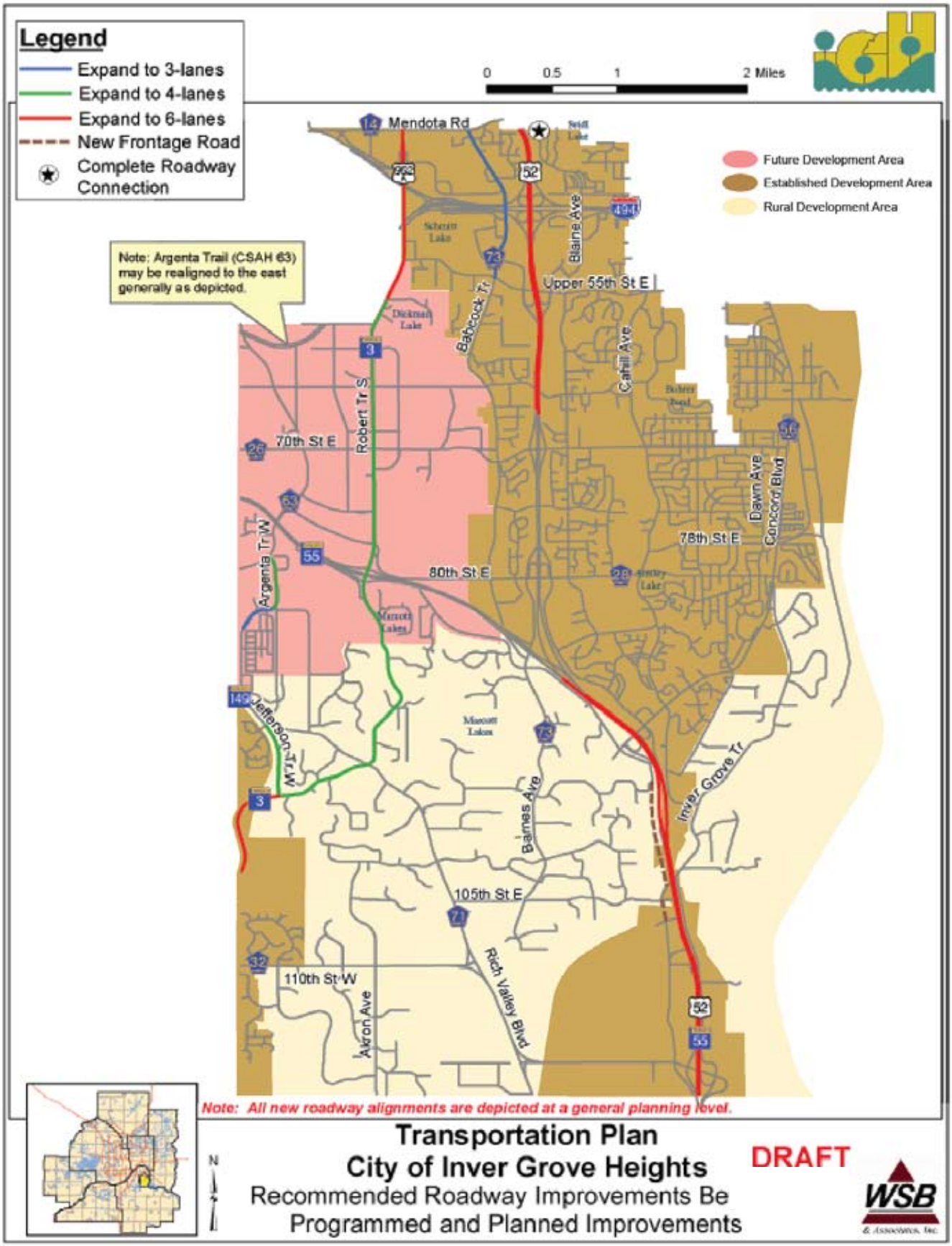


Figure 5.14: Recommended Roadway Improvements



The assumed number of lanes for 2030 conditions are presented on Figure 5-12. The projected 2030 congestion levels associated with 2030 traffic volumes and the baseline 2030 Roadway network are presented on Figure 5-13. Figure 5.14 identifies recommended roadway improvements. These are improvements over and above programmed and planned improvements which will be required by 2030.

Future Roadway Needs

The previous section addressed the assumed 2030 roadway network and projected 2030 roadway deficiencies. The focus of this section is "moving forward" with planned and recommended projects. It is organized according to the three major development areas in the City as described previously (Future Development, Established Development, and Rural Development).

Future Development Area

Interchange at I-494/Argenta Trail (CSAH 63) - Planned Improvement

- Identification in transportation plan
- Further coordination with other agencies, coordinate with Mn/DOT to take project lead
- Coordinate funding (developer participation, other agencies' participation)
- Preliminary design/environmental documentation (NEPA)
- Interstate access request
- Final design/construction

Interchange at TH 55/Argenta Trail (CSAH 63) - Planned Improvement

- Identification in transportation plan
- County will Lead - Coordination with other agencies, concurrence with Dakota County on general design parameters
- Coordinate funding (developer participation, other agencies' participation)
- Preliminary design/environmental documentation (NEPA)
- Final design/construction

North West AUAR Area Collector Roadway Network - Planned Improvement

- Preliminary alignment engineering (topography, environmental, connectivity, etc.)
- Alternatives analysis

Phasing of Roadway Improvements

The North-South Corridor Study identified developing a phasing plan for roadway improvements. Future roadway improvements will need to be developed in coordination with development in the area. See pages 2-33 and 2-34 and the discussion on future growth phasing.

- Agency coordination (e.g. Eagan for 65th St. extension)
- Developer coordination

Argenta Trail Improvements - Planned Improvement

- Coordination with Dakota County regarding project leadership
- Preliminary developer coordination
- Preliminary alignment engineering (interchange connections, topography, environmental)
- Preliminary design/NEPA documentation
- Final design/construction

Jefferson-Argenta Extension - Planned Improvement

- Coordination with Dakota County and Mn/DOT confirming project benefits and need
- Determination of agency roles/responsibilities
- Preliminary design/NEPA documentation
- Final design/construction

Future Development Area Transportation Actions

- Preserve right-of-way for a future interchange at I-494 and Argenta Trail.
- Preserve right-of-way for a future interchange at TH 55/CSAH 63 /CSAH 28.
- Preserve right-of-way for future collector roadway improvements.

Future Development Area Transportation Policies

- Review and update the NW Area AUAR ever five years as mandated by State Statute.
- Continue to coordinate roadway improvements with local, regional and state agencies.
- Monitor and administer access management guidelines.
- Encourage system connectivity.

Established Development Area

Blaine Avenue/Southview Boulevard Connection - Recommended Improvement

One issue identified in the 2020 Inver Grove Heights Transportation Plan that the City has not been able to resolve is the desired connection of 21st Avenue to Southview Boulevard (CSAH 14) in South St. Paul. Twenty-first (21st) Avenue is the northerly extension of Blaine Avenue in Inver Grove Heights, a Community Collector roadway. Southview Boulevard is a Major Collector roadway on the Metropolitan Council functional classification map. There currently is not a connection between 21st Avenue and Southview

Boulevard, although the two roadways come close to each other. Under current conditions, northbound motorists on Blaine Avenue must turn right on Bloomberg Lane, which becomes 18th Avenue in South St. Paul, to access Southview Boulevard.

The direct connection between 21st Avenue and Southview Boulevard is advisable in terms of network connectivity and orderly traffic flow. The Metropolitan Council has, in the past, been involved to help resolve this issue. The City of Inver Grove Heights understands that the direct connection involves political issues that have been difficult to resolve, but it will continue to coordinate with the City of South St. Paul to attempt to advance this transportation improvement.

CSAH 73 (Babcock Trail) - Recommended Improvement

Without improvements, projected 2030 traffic volumes will lead to LOS F conditions north of Upper 55th Street to I-494, and LOS E conditions north of I-494. A 3-lane design will be required from Upper 55th Street through the northern City limits and potentially beyond. It is recommended that the City coordinate with Dakota County and the City of West St. Paul to perform the necessary planning regarding this improvement as the need arises with development.

TH 52 - Recommended Improvement

North of CSAH 26 (70th Street), TH 52 is projected to see volumes in excess of 90,000 vehicles per day by the year 2030. This will necessitate an additional lane in each direction to maintain LOS D operational conditions. Mn/DOT has not identified this improvement in their 2008-2030 Metro District TSP.

CSAH 56 (Concord Boulevard) - Recommended Improvement

It can be seen on Figure 5-13 that CSAH 56 is projected to experience the following operational conditions by 2030:

- Old Concord Boulevard to CSAH 28 (80th Street) – LOS D
- CSAH 28 (80th Street) to CSAH 26 (70th Street) – LOS E
- CSAH 26 (70th Street) to northern City limit – LOS F

This analysis assumes the reconstruction of CSAH 56 as a 3-lane roadway which is currently taking place and is anticipated to be completed by 2009. Dakota County and its project partners, including the City of Inver Grove Heights, went through an extensive planning process to determine the appropriate design for this reconstruction project. The project partners understood that the 3-lane design would not provide desirable long-term

CSAH 56 (Concord Blvd.)

In the long term, the City will proactively explore redevelopment opportunities that contribute to additional capacity and safety along the corridor.

traffic capacity, but chose this design anyway in the effort to balance traffic operational considerations with the need to limit local impacts in this situation. Traffic conditions will need to be monitored to determine if excessive congestion and safety problems occur over time and improvements need to be recommended in future plan updates.

Established Development Area Transportation Actions

- Coordinate with Dakota County in monitoring CSAH 73 (Babcock Trail) traffic volumes and levels of service between Upper 55th Street E. to 80th Street E. and evaluate the need for potential improvements.
- Coordinate with Dakota County to monitor CSAH 56 traffic volumes and conditions.

Established Development Area Transportation Policies

- Continue to coordinate roadway improvements with local, regional and state agencies.
- Monitor and administer access management guidelines.
- Monitor and evaluate the need for improvements using best management practices and TSM programs.

Rural Development Area

Westerly TH 52/55 Frontage Road - Recommended Improvement

The City desires a frontage road on the west side of TH 52/55 between Briggs Drive and CSAH 56 (Concord Boulevard) at Courthouse Boulevard and has discussed this improvement with Mn/DOT. Combined with existing Clark Road, this will provide a continuous westerly frontage road between the 117th Street interchange and CSAH 56. Mn/DOT has indicated that there is not sufficient funding for such a project at this time. The City will continue to coordinate with Mn/DOT, as well as Dakota County to advance this project.

TH 52/55 - Recommended Improvement

From the TH 52/55 split south to the southern City limit this 4-lane divided roadway is projected to see traffic in the general range of 80,000 vehicles per day by 2030. This will require a 6-lane freeway design. In the 2008-2030 Metro District Transportation System Plan (TSP), Mn/DOT has identified the need to add a lane in each direction for this segment (south to CSAH 46). However, no funding has been secured for this improvement.

Trunk Highway 149 (Jefferson Trail West) - Recommended Improvement

2030 traffic volumes on TH 149 north of TH 3 are projected to be approximately 30,000 vehicles per day which would require a 4-lane divided design. Only

a small segment of this roadway is within the City of Inver Grove Heights. The City of Inver Grove Heights will support efforts by Mn/DOT to improve TH 149.

Rural Development Area Transportation Actions

- Coordinate with Dakota County to monitor CSAH 32 (110th St. W./ Rich Valley Blvd./117th Street) – western City Limit to TH 55/52 traffic volumes, levels of service and evaluate the need for potential improvements .
- Coordinate with Dakota County to monitor CSAH 73 (Barnes Avenue) between TH 55 and CSAH 71 (Rich Valley Boulevard) traffic volumes, levels of service and evaluate the need for potential improvements.

Rural Development Area Transportation Policies

- Preserve right-of-way for future roadway improvements.
- Continue to coordinate roadway improvements with local, regional and state agencies.
- Monitor and administer access management guidelines.

Trunk Highway 3

It is recommended that MnDOT conduct a corridor improvement and access management study in collaboration with Dakota County and the City of Inver Grove Heights.

Corridors Spanning Multiple Development Areas

Trunk Highway 3 - Recommended Improvement

With added regional traffic as well as traffic from anticipated development in the northwest portion of Inver Grove Heights, TH 3 is projected to see very large increases in traffic volumes by 2030. This assumes the Jefferson-Argenta connector as discussed previously and assumed in Dakota County's North-South Corridor Travel Demand Study (2007), which would relieve traffic volumes on TH 3. With the projected 2030 volumes as depicted on Figure 5-10, TH 3 will need to be expanded to:

- a 6-lane from approximately Upper 55th St. to the northern City limit and beyond.
- a 4- lane from approximately Upper 55th St. to TH 149
- a 6-lane south of TH 149

This corridor represents a significant challenge for capacity expansion because of hilly topography and the presence of natural features such as wetlands. A corridor improvement and access management study is recommended for TH 3. This study will identify and evaluate alternatives, and will provide a vehicle for coordination between the agencies involved.

One of the alternatives to be refined and evaluated would be the Jefferson-Argenta connection discussed previously which, in conjunction with TH 149 (Jefferson Trail) and CSAH 63 (Argenta Trail) would serve as a westerly reliever of TH 3. Since TH 3 this is a trunk highway, Inver Grove Heights would coordinate closely with Mn/DOT to initiate and carry out the study. Other key participants would be the Cities of Eagan and Sunfish Lake, Dakota County, and possibly the Cities of Rosemount and West St. Paul.

Corridor Transportation Actions

- Promote a TH 3 corridor improvement and access management study for TH 3 to be led by MnDOT.

Corridor Transportation Policies

- Preserve right-of-way for future roadway improvements.
- Continue to coordinate roadway improvements with local, regional and state agencies.
- Monitor and administer access management guidelines.

2030 Functional Classification Plan

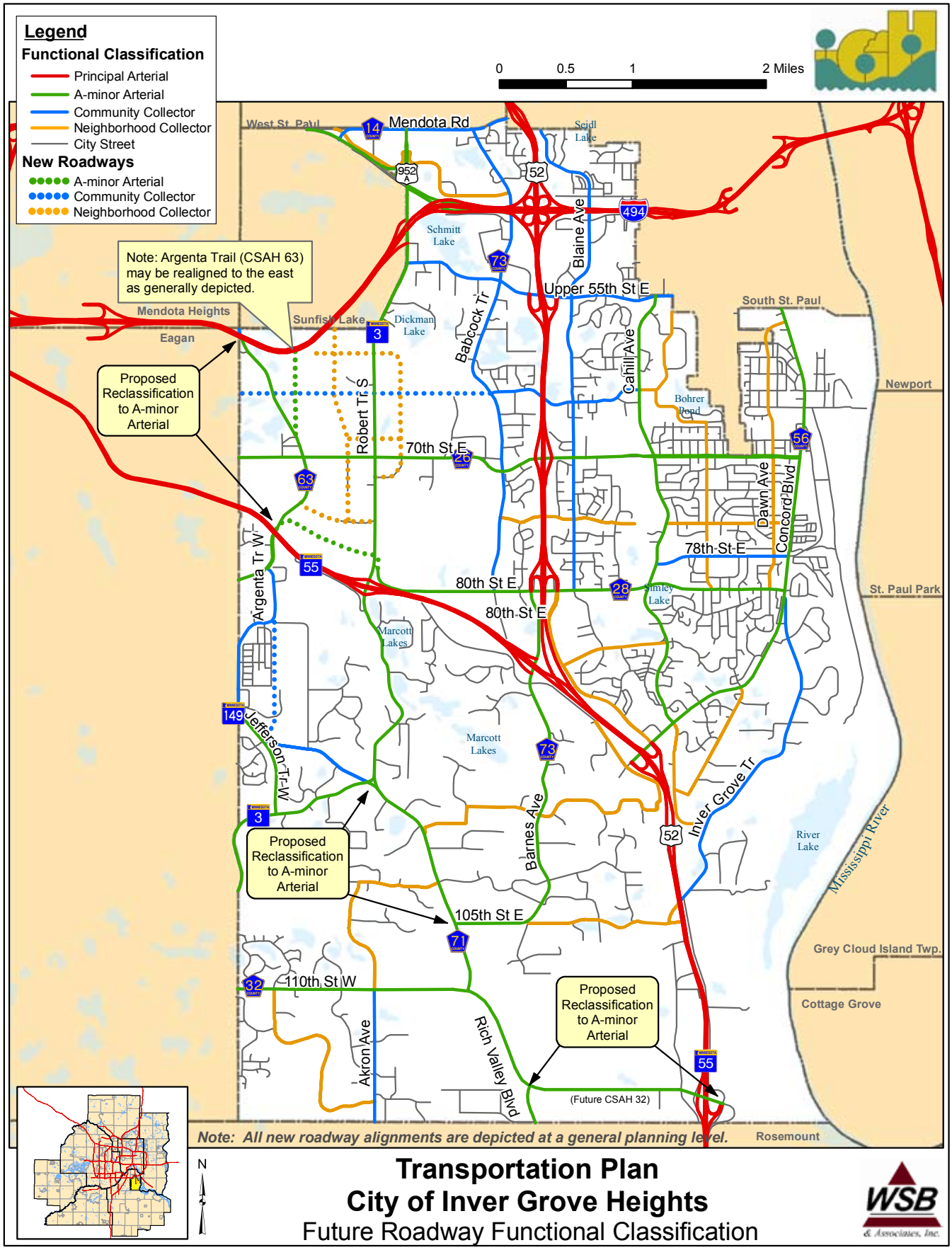
The existing functional classification network for roadways in Inver Grove Heights was discussed in the Existing Conditions section earlier in this Transportation Plan. The Metropolitan Council has published roadway functional classification as an appendix to the 2030 Transportation Policy Plan. These guidelines should be used when identifying and considering revisions to the functional classification network.

Reclassification

The Inver Grove Heights 2030 functional classification map is presented on Figure 5-15. Revisions relative to the existing network are summarized below:

1. 117th Street from Rich Valley Boulevard to TH 52; reclassification as "A" minor arterial – As discussed previously, Dakota County intends to complete a roadway project linking Cliff Road (CSAH 32) east to TH 52. This will likely involve curves at Cliff Road/Rich Valley Boulevard and at Rich Valley Boulevard/117th Street to allow east-west continuity. CSAH 32 would follow the Rich Valley Boulevard (CSAH 71) alignment and then east on the 117th Street alignment to TH 52. CSAH 32 and CSAH 71 are both currently "A" minor arterials. With the overall project, current 117th Street would be reclassified

Figure 5.15: Future Roadway Functional Classification



as an "A" minor arterial to complete the continuity. This reclassification would be initiated by Dakota County with final approval required from the Metropolitan Council.

2. Rich Valley Boulevard (CSAH 71) between TH 3 and 105th Street (CSAH 73); reclassification as an "A" minor arterial – CSAH 71 is currently classified as "A" minor arterial from south of Inver Grove Heights to CSAH 73. Then between CSAH 73 and TH 3 it is classified as a community collector roadway. For continuity, the "A" minor arterial status of CSAH 71 should be extended north to TH 3. This reclassification was identified in the 2020 Inver Grove Transportation Plan. It would be initiated by Dakota County with final approval required from the Metropolitan Council.

3. Argenta Trail (CSAH 63) between I-494 and TH 55; reclassification as "A" minor arterial – As discussed previously, interchanges at I-494 and TH 55 are identified in this Transportation Plan. With these interchanges, CSAH 63 would become an "A" minor arterial. This reclassification would be initiated by Dakota County with final approval from the Metropolitan Council.

4. 65th Street between Cahill Avenue and Babcock Trail (CSAH 73); reclassification from neighborhood collector to community collector – This reclassification will become appropriate with the anticipated extension of 65th Street west from Babcock Trail to the westerly City limit. The overall roadway will become an important east-west link in the northern portion of the City, connecting an "A" minor arterial (Babcock Trail) with TH 3, Argenta Trail, and the City of Eagan to the west.

2030 JURISDICTIONAL CLASSIFICATION ISSUES

The only anticipated change in jurisdictional classification status is 117th Street between Rich Valley Boulevard (CSAH 71) and TH 52/55, going from local to Dakota County jurisdiction.

ACCESS MANAGEMENT

Proper access management is a key component of providing a roadway system that effectively balances mobility and access needs (see Figure 5.16: Access Management). Access management concerns the number of roadways and/or driveways that are allowed to directly access a given roadway, as well as facility design at the access points. Arterial roadways, which primarily serve a mobility function, can only have limited access so as to not disrupt the flow of traffic and not create safety concerns. At the other end of the spectrum, the primary function of local streets is to provide access to local land uses, so there are fewer access restrictions on these

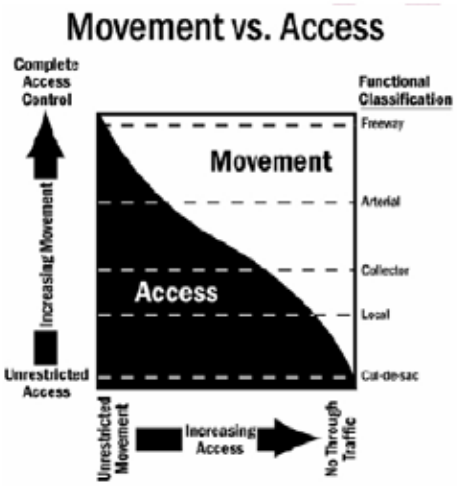


Figure 5.16: Access Management

roadways. However, there are important considerations regarding access on local streets as well. Collector roadways are between arterials and local streets in terms of access allowed, since they serve a relatively even balance of the mobility and access functions.

Numerous studies have demonstrated the safety and operational benefits of managing access in an appropriate manner. The government agency which has jurisdiction over a given roadway determines the applicable access management guidelines for that facility. Mn/DOT has access management guidelines that apply to Trunk Highways, such as TH 3 (So. Robert Trail). These guidelines are included in Appendix T-n. Similarly, Dakota County's access guidelines apply to County roadways within Inver Grove Heights. County roadways make up a substantial portion of the roadway network serving the City. Dakota County Access Management Guidelines are also provided in Appendix T-n. Access management is also important for roadways under Inver Grove Heights' jurisdiction. Recommended City access management guidelines are provided in Table 5-8, below:

Table 5-8: Proposed Inver Grove Heights Access Management Guidelines

Type of Access	Minor Arterial	Collector	Local
Residential Driveways	No Direct Access	No Direct Access	As Required
Commercial Driveways	Based on: Speed, Traffic Volume, Sight Distance, etc. (1/8 to 1/4 mile)	Based on: Speed, Traffic Volume, Sight Distance, etc. (min. 250 ft.)	Based on: Speed, Traffic Volume, Sight Distance, etc. (min. 100 ft.)
Low Volume Streets	Full Access - 1/8 mile	Full Access - 1/8 mile	Full Access - 330 ft.
	Partial Access - 330 ft.	Partial Access - 330 ft.	Partial Access - 330 ft.
High Volume Streets < 10,000 ADT	Full Access - 1/4 mile	Full Access - 1/8 mile	Full Access - 330 ft.
	Partial Access - 1/8 mile	Partial Access - 330 ft.	Partial Access - 330 ft.
Collector Streets	Full Access -1/2 mile	Full Access - 1/4 mile	Full Access - 1/8 mile
	Partial Access - 1/4 mile	Partial Access - 1/8 mile	Partial Access 330 ft.

PLEASE NOTE: The spacing guidelines identified in this table may be adjusted on a case-specific basis pending detailed traffic engineering analysis and review by the City Engineer.

Transit Plan

The existing transit service was described in the Existing Conditions section of this transportation plan and is summarized on Figure 5-6. Scheduled transit service in Inver Grove Heights is provided by Metro Transit, a division of the Metropolitan Council. In addition, Dakota County is taking on an increased role in planning and facilitating enhanced transit facilities and services. In general, transit and transit planning are subject to the constraints of existing funding levels and the uncertainties associated with future funding. Funding levels are determined to a large extent on decisions made at the State Legislature.

METROPOLITAN COUNCIL/METRO TRANSIT PLANNING INFORMATION

The Metropolitan Council has established a series of transit market areas throughout the metropolitan area as a guide for the provision of appropriate transit service. There are four market areas, I through IV, based on the propensity to use transit, or the likelihood of high transit ridership. The ranking is based primarily on four factors:

- Population density
- Employment concentration and job density
- Trip volumes and patterns
- Transit dependent segments of the population

With higher population and job density, high trip volumes, and relatively high percentages of transit-dependent individuals, more ridership is anticipated and higher levels of transit service is thus justified. Market Area I has the highest transit potential for transit ridership and associated justification for extensive service, and Market Area IV has the lowest potential for transit ridership.

Based on Metropolitan Council information, the northern portion of the City (north of I-494) is in Market Area II, the central portion in Market Area III and IV, and the southern portion in Market Area IV (see Figure 5.17: Transit Market Areas). Service options for Market Area II include regular fixed-route local service, all-day expresses, small vehicle circulators, special needs paratransit, and ridesharing. Service options for Market Area III include peak-only express, small vehicle circulators, midday circulators, special needs paratransit, and ridesharing. Service options for Market Area IV include paratransit, volunteer driver programs, and ridesharing.

Metropolitan Council - Transit Market Areas

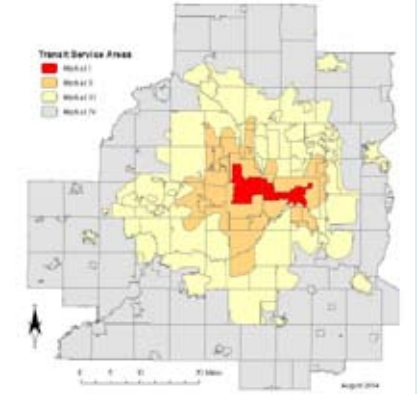
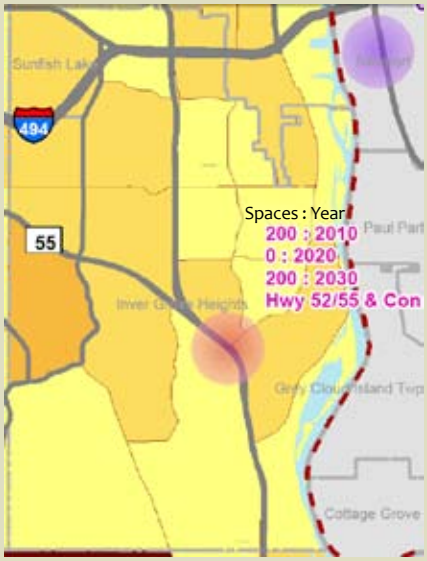


Figure 5.17: Transit Market Areas

Park & Ride Facilities



IGH objective is to make sure that future park-and-ride facilities are planned for Transit Oriented Development (TOD) and not solely as a park-and-ride lot (see Land Use Chapter).

Figure 5.18: Park & Ride Facility Site Plan Map
Source: Metropolitan Council

Metro Transit is not currently planning to expand fixed-route service in Inver Grove Heights at this time. The City of Inver Grove Heights and Inver Hills Community College will work with Metro Transit to continue, and where feasible, improve transit service for the community.

In its Park and Ride Facility Site Plan (2005), Metro Transit performed analysis to identify locations where new and/or additional park-and-ride capacity will be needed through 2030. This document identified the need for a park-and-ride facility with 200 parking spaces at TH 55/TH 52 and Concord Boulevard (see Figure 5.18: Park and Ride Facility Site Plan Map). This assumes the provision of express service at this location. The City will work with Metro Transit and Dakota County to support the provision of express bus service along TH 52 to Downtown St. Paul, and along TH 55 to the Hiawatha LRT line and the destinations accessible with that service.

DAKOTA COUNTY ROBERT STREET CORRIDOR TRANSIT FEASIBILITY STUDY

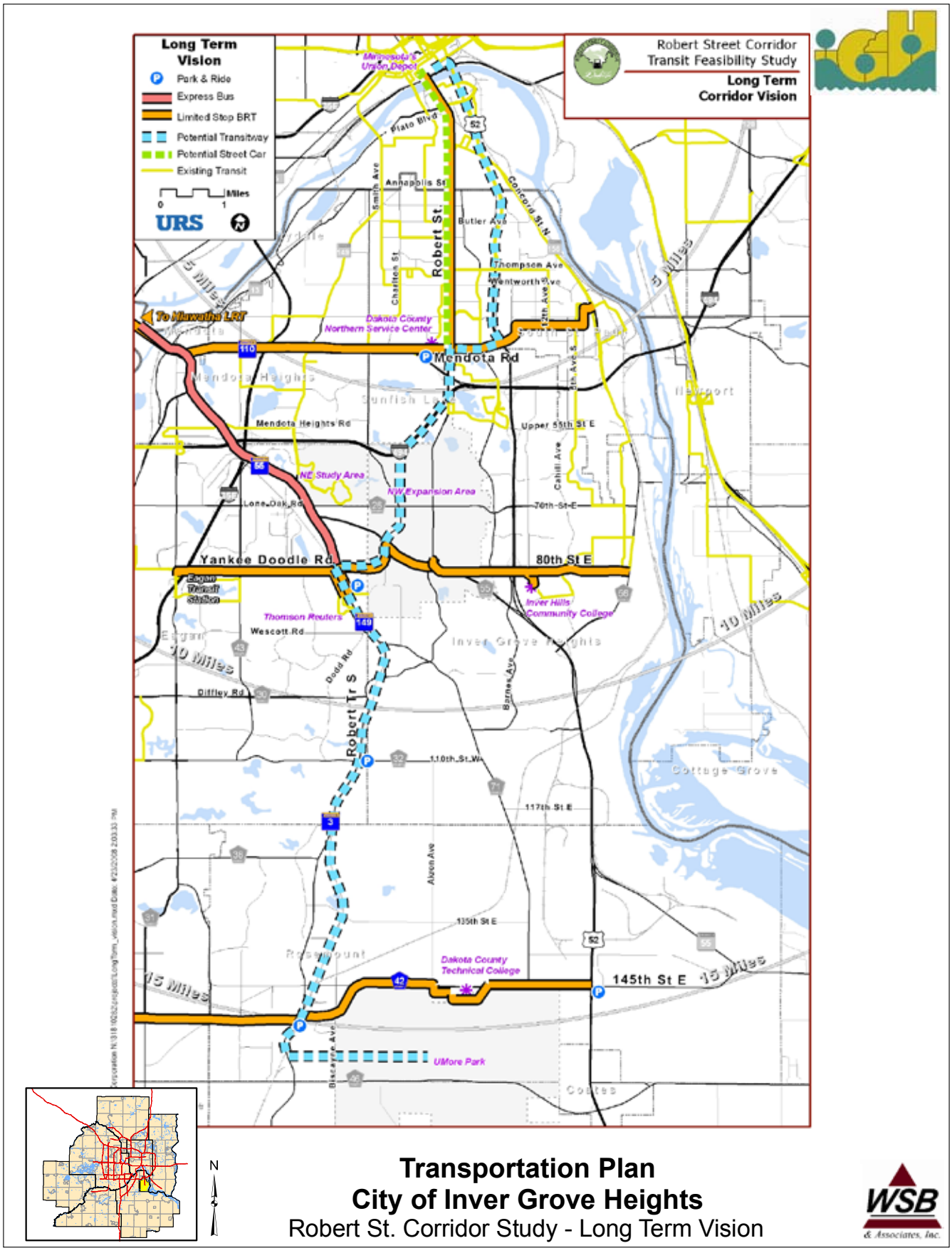
Dakota County has recently completed its Robert Street Corridor Transit Feasibility Study. Inver Grove Heights had representation on the Technical Advisory Committee and the Steering Committee for this project. The study area is generally bounded by Downtown St. Paul to the north, CSAH 31 (Pilot Knob Road) to the west, CSAH 46 to the south, and the Mississippi River to the east. There currently is not extensive transit service in this area. This factor, combined with anticipated continued development, increasingly congested roadways, and an aging population, create the need to explore potential transit options and improvements. The Metropolitan Council Regional Transitway Map (see Figure 5.19: Transitway Map) does not include a regional transitway to serve the project area; a gap which Dakota County and its study partners wished to address.

Figure 5.19: Regional Transitway Map
Source: Metropolitan Council

This study is a long-term, planning level effort to evaluate general alternatives and make recommendations for future evaluation and potential implementation steps. While the title of the study includes "Robert Street Corridor," a number of corridors, including north-south, east-west, and radial (e.g. TH 55) were evaluated in the study process (see Figure 5.20: Robert Street Corridor. A Long-Term Corridor Vision has been identified and released by the County, as depicted on Figure 5.20.

From the perspective of this Transportation Plan, the primary recommendations from the Robert Street Corridor Transit Study process are identified under the following headings:

Figure 5.20: Robert Street Corridor



Short Term Actions

- Establish transit center in the vicinity of Dakota County's Northern Service Center at TH 110 and Mendota Road E (CSAH 14) just north of Inver Grove Heights
- Develop transit oriented development (TOD) guidelines for adoption by local governments
- Establish limited stop bus routes on TH 3(Robert Street)

Medium Term Bus Improvements

- Expand service hours on existing local bus routes
- Implement new, limited stop bus service on major east-west corridors, including TH 110 and Yankee Doodle Rd. (CSAH 28) – (the map also shows this service extended east on CSAH 28 past Inver Hills Community College to Concord Boulevard (CSAH 56)
- Develop new transit centers and/or expand service to: Inver Hills Community College, Dakota County Northern Service Center, and Thomson Reuters
- Develop regional capital funding plan for transit improvements
- Develop dedicated funding plan for transit operating expenses

Long Term Vision

- Improved mobility and accessibility to activity centers including Downtown St. Paul, Dakota County Northern Service Center, Inver Hills Community College, and Thomson Reuters
- Transit options for the planned growth areas of northwest Inver Grove Heights and northeast Eagan
- Opportunities to focus and enhance new Transit Oriented Development at future transit station sites

CITY OF INVER GROVE HEIGHTS SUMMARY

The City of Inver Grove Heights will work with the Metropolitan Council and Dakota County to enhance transit opportunities for its residents. Important transit-related goals for the City include the following:

- Maintain and enhance transit service to Inver Hills Community College
- Support limited-stop east-west bus service on TH 110 and Yankee Doodle Road/80th Street (CSAH 28)
- Support express bus service along TH 55 to connect with Hiawatha LRT facilities and service and job centers along the I-494 corridor.
- Support express transitway development into downtown St. Paul

- Ensure transit is considered and accommodated in the Northwest area development, including Transit Oriented Development concepts implemented where appropriate.
- Support the evaluation and development of park-and-ride facilities as a component of a larger development when possible; locations that have been identified by other agencies include TH 52/CSAH 56 (Metropolitan Council); Dakota County Service Center, Inver Hills Community College, Thomson Reuters (Dakota County)

Aviation

There currently are no existing or planned aviation facilities within the City of Inver Grove Heights. However, each community has a responsibility to include airspace protection in its comprehensive plan. This includes potential hazards to air navigation including electronic interference. Inver Grove Heights is located within the airport Influence Area of the Minneapolis/St. Paul International Airport (MSP) and Fleming Field (see Figure 5.21: Influence Area).

MINNEAPOLIS/ST. PAUL INTERNATIONAL AIRPORT

The Minneapolis/St. Paul International Airport is operated by the Metropolitan Airports Commission located approximately 4.4 miles west-northwest of the City of Inver Grove Heights. It is designated as the region's "Major" airport and is expected to fill that role for many years to come according the Metropolitan Council's System Statement for the City of Inver Grove Heights.

MSP noise policy contours no longer extend into Inver Grove Heights. However, a one-mile buffer zone provides the City with additional flexibility in addressing local land use concerns. Land use compatibility within the buffer zone is the same as defined for Noise Zone 4 (DNL65-60). The City has established a Noise Abatement Overlay in Subdivision 34 of its Zoning Ordinance defining City requirements, which are consistent with the Metropolitan Council's Guidelines for Land Use Compatibility with Aircraft Noise.

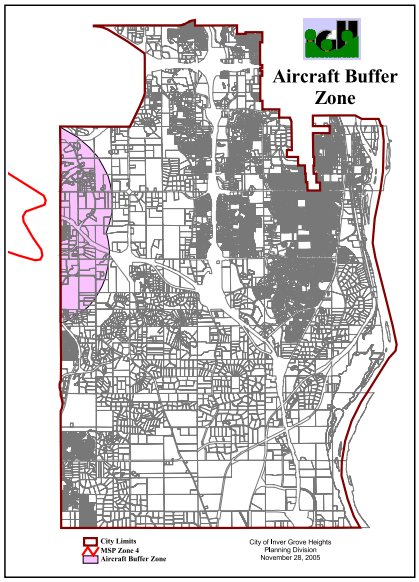


Figure 5.21: Influence Area

Minnesota Statues 360

Under Minnesota Statues 360, the state regulates the height of structures as they are defined and enforced under Aeronautics Rules and Regulations 8800.1200 Criteria for Determining Air Navigation Obstructions. Subparagraph 4(B) states:

"objects more than 200 feet above the ground or more than 200 feet above the established airport elevation, whichever gives the higher elevation, within three nautical miles of the nearest runway of an airport, and increasing in the proportion of the 100 feet for each additional nautical mile of distance from the airport but not exceeding 500 feet above ground", is a general obstruction.

Notification to Mn/DOT Aeronautics is required when any object, as defined in Minnesota Statues 360, would affect general airspace.

Local reporting is in addition to any Federal permitting/review process (FAA Form 7460-8) involving a sponsor/proposal.

SOUTH ST. PAUL MUNICIPAL AIRPORT (FLEMING FIELD)

Fleming Field is located north of 70th Street between Cahill Avenue and Concord Boulevard. Fleming is designated as a reliever facility for MSP providing general aviation needs to the local area as well as air travel from outside the region. The facility encompasses 204 acres with one paved north/south runway that is 4,000 feet in length.

The City of South St. Paul is responsible for preparation of the airport comprehensive plan. This includes associated hanger and maintenance facilities, some of which are located north of 63rd Street East in Inver Grove Heights. The airport has made improvements along Craig Avenue in recent years to make the surrounding residential neighborhood more compatible with the airport.

The South St. Paul Municipal Airport will continue to be a part of the regional airport system well into the foreseeable future. As such, the City of Inver Grove Heights will continue to work with the City of South St. Paul to ensure a safe and compatible environment exists for both the airport and surrounding land uses. Requirements for development in proximity to Fleming Field are identified in Subdivision 36 of the Inver Grove Heights Zoning Ordinance. These requirements cover issues including airspace obstructions, land use safety, and hazard marking and lighting.

AVIATION POLICIES

The following policies will help guide the City in addressing land use and airport environment related issues:

- Apply the Metropolitan Council land use compatibility guidelines to new development.
- Create an awareness of the airport environment by educating the public.
- Notify Mn/DOT Aeronautics of any structure 200 feet above the ground that could affect airspace.
- Engage in conversations with adjacent communities on airport environment issues.
- Work with the MAC in locating airport navigational facilities as needed.
- Consider incorporating noise mitigation techniques in new residential construction.

Parks & Recreation

CHAPTER 6

Introduction

Inver Grove Heights is well served by its developed parks, trails, recreation facilities and open spaces. These elements are important to residents and are a significant factor in maintaining a healthy community with a high quality of life. Parks define neighborhoods, offer recreation opportunities, and serve as open space and wildlife habitat. Parks act as neighborhood gathering points and strengthen the sense of community. The developed park system provides a solid foundation from which the City can expand to serve future residents. Inver Grove Heights is committed to meeting its resident's parks and recreation needs and will plan wisely for the future.

Rich Valley Playground

South Valley Shelter

In 2008, the City prepared a major update to the Comprehensive Park Plan and Development Guide (the "2008 Plan"). The 2008 plan is designed to help continue the tradition of providing quality parks, trails, open spaces and recreation facilities with both passive and active recreational opportunities through well-balanced parks and facilities. The 2008 Plan provides a framework for decision making to guide in the preservation of open space and the development of park facilities and recreation programs designed to meet the leisure needs of the residents of Inver Grove Heights to the year 2030. This Parks, Trails and Open Space Chapter summarizes the more detailed 2008 Plan. The 2008 Plan focuses on seven key elements to guide the improvement and development of the park and recreation system to 2030:

- Acquisition of parks in the Northwest Area for new planned residential growth.
- Expansion of community athletic facilities.

- Continued development of its historical and cultural resources.
- Enhancing trail and bikeway connectivity.
- Preservation and management of natural resource lands.
- Leadership in sustainability.
- Improvements to promote a healthy and active community.

Existing Parks System

Inver Grove Height's developed park system consists of 836 acres of park and conservation lands and over 50 miles of combined trails and sidewalks not including those located on school sites. Schools provide an important recreational amenity for a number of neighborhoods in Inver Grove Heights and the City partners with the school district for some of its needs. This system was achieved through parkland dedication, partnerships with the school districts, donations and land acquisitions all designed to meet neighborhood and community recreation needs.

City Parks and Recreation Facilities

The Inver Grove Heights Park System is comprised of one community, twelve neighborhood, one linear and two special use parks, a historic site, five neighborhood playfields, one community athletic complex and four conservation sites. City owned parks and conservation lands represent roughly 5% of the City's land area. There are approximately 23 acres of parkland per 1,000 residents, not including school district athletic facilities or conservation lands. Schools provide additional space for athletic fields and facilities through joint powers agreements for use and maintenance of them; however, hours are limited to school off-hours. Conservation lands provide additional open space and access to natural resources. Within the park system are key community park and recreation facilities that provide community gathering, athletic fields and facilities, passive recreation and access to natural, cultural and historic resources including Veterans Memorial Community Center, Rich Valley Athletic Complex and Inver Wood Golf Course and Heritage Village Park. A summary of the existing parks and recreation facilities can be found in Table 6.1

Table 6.1 Inver Grove Heights Facility Grid

City of Inver Grove Heights Park and Facility Table

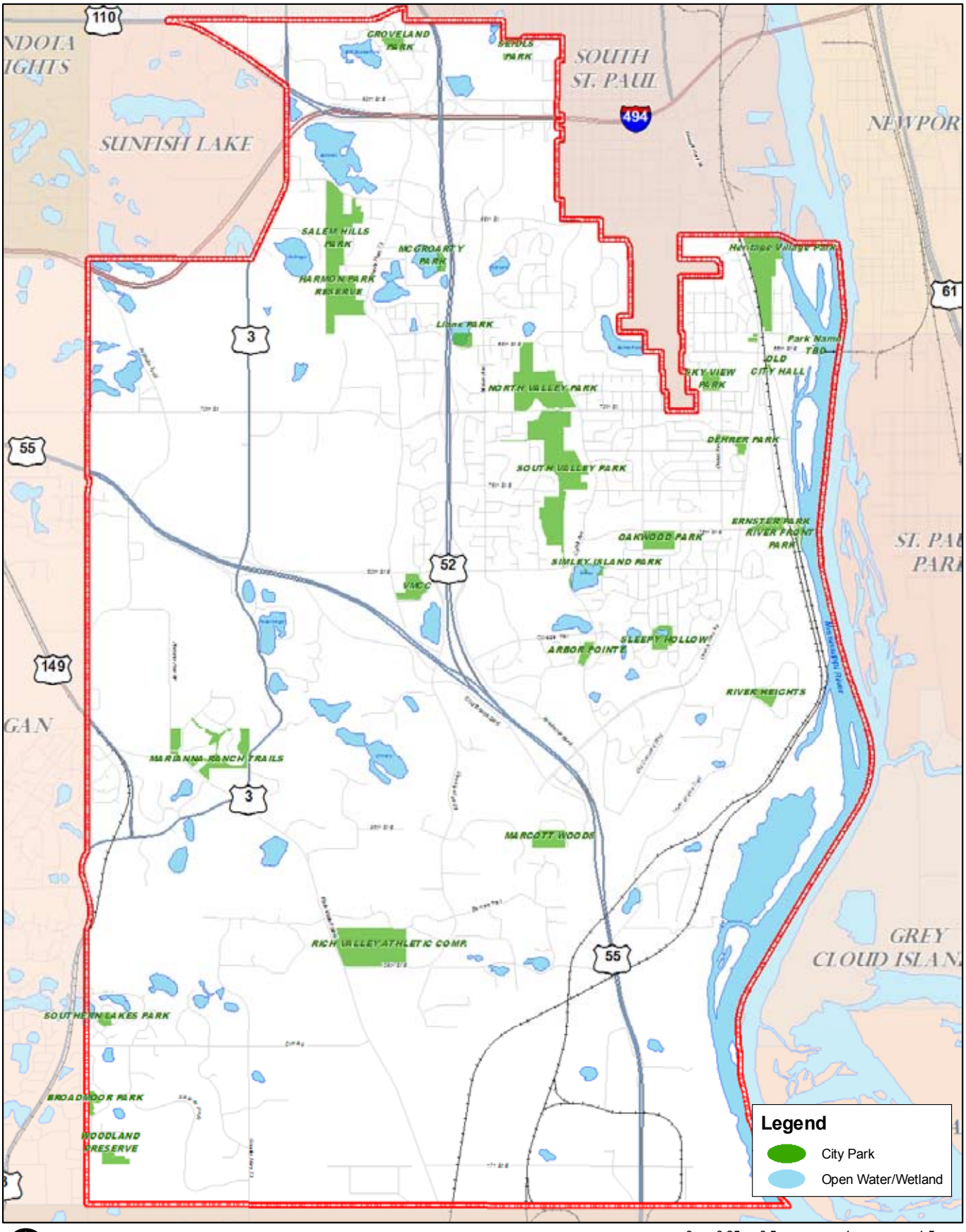
	Land Area (Acreage)	Water Area (Acres)	Picnic Shelter	Parking Lot (spaces)	Playground	Baseball/Softball Fields	Basketball Courts	Soccer Fields	Football/LaCrosse	Tennis Courts (lighted)	Tennis Courts (not lighted)	Sand Volleyball Court	Enclosed Shelter	Hockey Rinks (lighted)	Pleasure Rink	Sliding Hill (lighted)	Horseshoe Pits	Fishing	Fishing Pier	Disc Golf Course	Skate Boarding	Benches	Picnic Table(s)	Grill(s)	Water Fountain(s)	Tree Nursery	Paved Trail (ft)	Natural Trails (ft)	Mtn Bike Trails (ft)
Community Park																													
Heritage Village Park 65th Street and Concord Blvd.	50	PARK IS UNDER DEVELOPMENT																											
Community Athletic Complex																													
Rich Valley 1841 105th St. E (105th & RichValley)	71	2	2	603	1	9	1	4			1											67	9	4	5		8,604		
Neighborhood Playfield																													
Groveland 1990 46th St. (46th & Audrey Ave.)	6			19	1	1	1	1			1		1	1	1							3					756		
North Valley 2800 70th St. (70th St. & Cahill Ave.)	58	3		87		2		2			4									1		8	1	1	3		4,970		
Oakwood 3534 78th St. E. (78th St. & Clayton)	15		1	40	1	3		2		2			1	1	1							10		2			3,336		
Skyview 6765 Dawn Ave. (69th & Dawn)	8			20	1	2		2		2			1	2	1							10					711		
South Valley 2810 70th St. (70th St. & Cahill Ave.)	93		1	37	1	1		1					1		1	1						11	1	7			6,840	1,347	
Neighborhood Park																													
Arbor Pointe Park 8545 Cahill Avenue	4	1			1																	2					1,821		
Broadmoor Park 11306 Strafford Lane	7				1																	2	1				203	737	
Dehrer 4085 Dehrer Way	5																												
Ernster Park 7750 Dickman Trail	7				1	1	1					1					1						1				2,540		
Lions Park 2423 65th Street E. .	4	8	1		1													1	1			6							
River Front Park 7782 River Road	2																	1											
Salem Hills 1642 Upper 55th (Asher & Upper 55th)	41			26	1	1	1				2											6				1	2,151		
Seidl's Lake Park 2655 47th Street E.	26				1													1				1					166		
Simley Island 3110 80th St. E. (80th & Cahill Ave.)	3		1															1	2			1					120		
Sleepy Hollow 3645 84th Street E.	10				1		1					1					1					9					4,095		
Southern Lakes Park 10810 Alison Way	4	0			1	1																2					102		
Conservancy Land																													
Harmon Park Reserve 1642 Upper 55th Street E.	43																											1,812	22,294
Marianna Ranch 9125 Alverez Avenue	64																											9,681	
River Heights Park 8780 Inver Grove Trail	8																											1,937	
Woodland Preserve 11666 Azure Ln	10																												
Marcott Woods 2830 96th Street E.	14																												
Historic Site																													
Old Town Hall 6701 River Road	1																												
Park Name TBD (Rock Island Swing Bridge) End of 66th	22	PARK IS UNDER DEVELOPMENT																											
Lineal Park/Greenway																													
Hwy 52 Trail																											15,840		
McGroarty Park Co. Rd. 18 & Blaine Avenue	4	17																1				1							
Special Use Area																													
Inver Wood Golf Course 1850 70th St. E.	275			280																									
	Championship 18 and Executive 9 hole golf courses, driving range, XC - Ski Trails, Two weather shelters																												
Veterans Memorial Grove Community Center 8055 Barbara Ave.	13	2	1	365	1																1						932		
	The Veterans Memorial Community Center, Grove Fitness and Aquatics Center, Parks and Recreation Office																												
TOTAL	869	32	7	1,477	14	21	5	12	-	4	8	2	4	4	4	1	2	5	3	1	1	139	13	14	8	1	52,255	16,446	22,294

Independent School District 199 Facility Table

	Land Area (Acreage)	Playground	Baseball/Softball Fields	Stadium Football/Soccer Field	Tennis Courts (not lighted)
Simley High School 2920 - E 80th St	60		3	1	8
Simley Middle School 8167 Cahill Ave.	-		3		
Salem Hills Elementary 5899 Babcock Trail	11	1			
Hilltop Elementary 3201 - 68th St. E.	13	1	2		
Pine Bend Elementary 9875 Inver Grove Trail	26	1			
TOTAL	109	3	8	1	8

Last updated December 2009

Figure 6.1: Existing Park System



Existing Park System

Conservation Lands and Natural Resources

There are five City owned conservancy lands in the park system consisting of 139 acres of oak savanna, oak woodlands, wetlands, creeks, ponds and natural prairie areas that offer residents opportunities to access open space and natural resources. These sites include Harmon Park, Marianna Ranch, River Heights Park, Woodlands Park and Marcott Woods. In addition, there are other natural areas owned by regional public agencies or private institutions that offer conservation and natural resource oriented park amenities. These include Pine Bend Bluffs Scientific and Natural Area, a 256 acre area owned by the Minnesota DNR and the Katherine B. Ordway Natural History Study Area and a 278 acre preserve owned and operated by Macalester College for education and research purposes. The Pine Bend Bluffs Scientific and Natural Area is open to the public, however the Katherine B. Ordway Natural History Study Area is only open to the public on a limited basis with advanced approval.

Conservation

Conservation lands are community open space that contain significant natural resources and are preserved for environmental, open space & aesthetic purposes.

Harmon Park

Historical and Cultural Resources

The City of Inver Grove Heights has a rich history as a River City. There remain two historic buildings, the old town hall and school house and property along the Mississippi that the City has been acquiring for Heritage Village Park. The park encompasses the old "Village" settlement and rail yard transportation hub along the Mississippi River. The park will provide space for historic displays, outdoor education and a proposed railroad historic center. Near the park are the remains of an old roundhouse foundation and Swing Bridge. The City and the County are working in cooperation to save and restore the swing bridge, Bridge 5600, which is a double decked rail and vehicle bridge that served the railroad, stockyard, and travelers from 1894 until 1999 and connected Inver Grove Heights to Saint Paul Park. Each of these artifacts adds to the historical and cultural significance of the Concord Avenue commercial area and riverfront area and providing abundant opportunities for interpretation and education.

Historical Sites

Historical Sites contain historical features for preservation and interpretation.

Old Town Hall

Bridge 5600

Trails and Bikeways

Trails are an integral component of the City's park system. There are 24 miles of off-road, on-road and internal park trails located throughout the developed community. Trails offer residents safe access to many city-wide destinations such as schools, shopping areas, parks and a wide variety of natural resources. Some trails are destinations in themselves, offering scenic walks

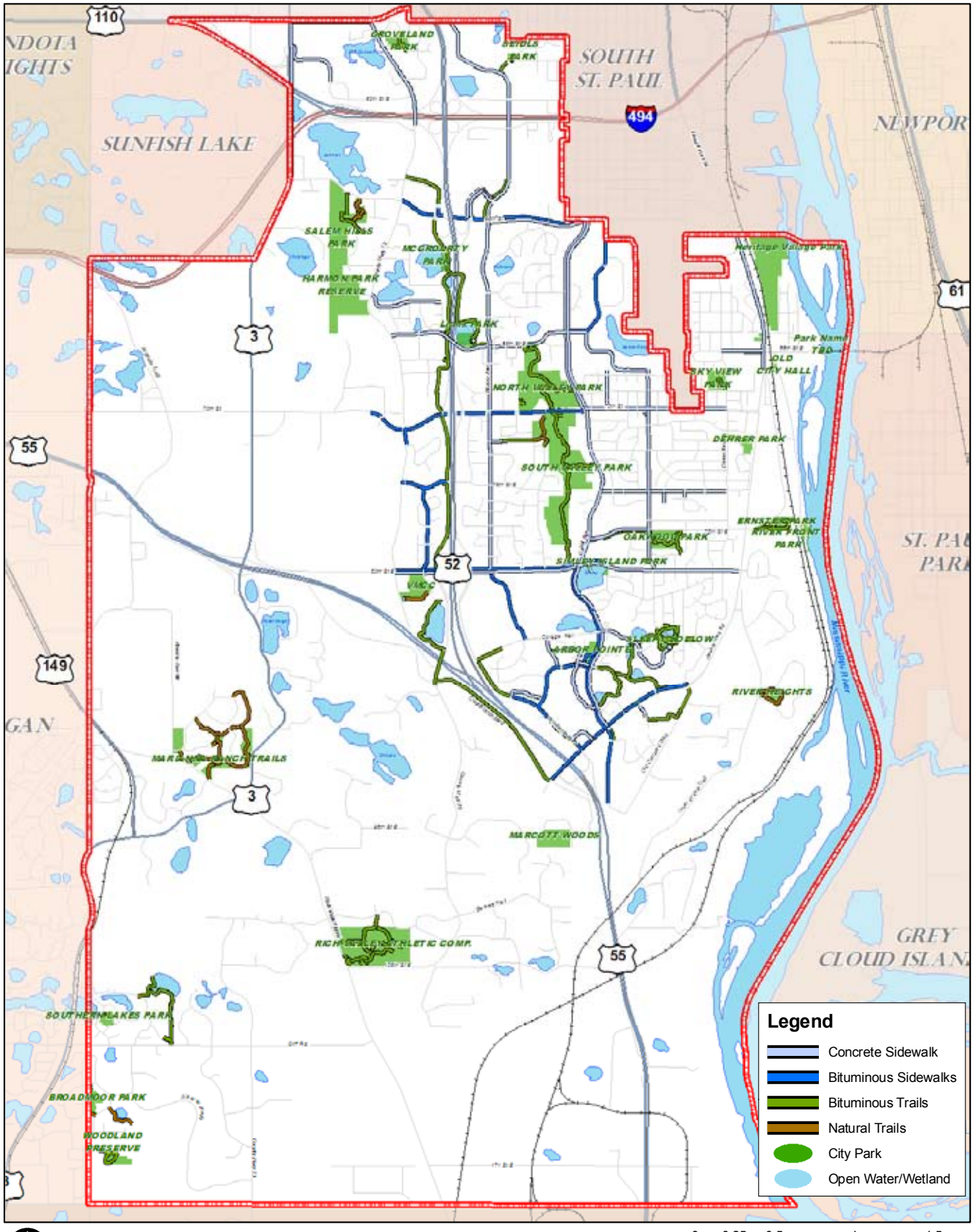
such as the trails in South Valley Park. In addition to City trails, county trails and paved shoulders provide transportation along major corridors through the City and between neighboring regional park destinations (see Figure 6.3 – Existing Trails Map).

The Dakota County Mississippi Regional Trail Corridor (MRRT) is proposed to follow the river, connecting Harriet Island Regional Park in St. Paul, Spring Lake Park Reserve and the City of Hastings (see Figure 6.2). The northern segment of this trail in South St. Paul has been constructed and is open to the public. The Inver Grove Heights segment is scheduled to be constructed between 2008 and 2010.

Dakota South Urban Regional Trail is a proposed regional trail that will connect Murphy-Hanrehan Regional Park Reserve, the Minnesota Zoo, Lebanon Hills Regional Park, the Mississippi River Regional Trail and Spring Lake Regional

Figure 6.2 - Dakota County Mississippi Regional Trail Corridor (MRRT)

Figure 6.3: Existing Trail System



Existing Trail & Sidewalk System

Park Reserve. The exact location of this trail will be determined when a master plan is prepared.

Dakota North/South Regional Trail search area is a proposed regional trail that will connect the North Urban Regional Trail, Lebanan Hills Regional Park, Empire Wetlands Regional Park, the proposed Dakota South Cannon River Regional Trail, and Lake Byllesby Regional Park. The exact location of this trail will be determined when a master plan is prepared.

Parks System Framework

Introduction

Park, recreation, open space and trail connections are essential components of a healthy community. Decisions about parks, trails and open space affect the entire community, enhance sense of community and affect the quality of life in the City. The following park system framework was prepared to guide park planning and decision making. The framework criteria are based on national park and recreation standards developed by the National Parks and Recreation Association modified based on local conditions. This framework should be used as a guide and should be adjusted over time as local conditions change with community needs and trends.

Overall Park Area Standard

One accepted measurement of a park system is the quantity of parkland per 1,000 persons. The National Recreation and Parks Association developed a minimum standard of ten acres per 1,000 residents. In the Twin Cities, the accepted minimum standard is a range from 10 - 20 or more acres of parkland per 1,000 residents. Parkland acres refers to neighborhood parks, playfields and community parks and typically does not include trail corridors, special use parks, school lands, regional parks or conservation areas. This park area standard should be viewed as a benchmark for comparison purposes.

Park Classifications

Parks serve a variety of purposes, providing active and passive recreation and open space at a neighborhood and community wide scale. For planning purposes, the City has adopted a uniform park classification system that classifies parks according to their use and function. The existing park classifications include community parks, neighborhood playfields, neighborhood parks, special use areas, historic sites, conservation lands, linear parks and park/school recreation. The future park classifications applicable to future urban residential areas outside the present developed urban areas exclude neighborhood playfields and linear parks. Community active recreation needs are better served by Community Athletic Complexes which are the preferred park type for community-wide active recreation.

McGroarty Lake

Table 6.2: Inver Grove Heights' Park Classifications

Park Classification	Use/Design Direction	Service Area	Size	Acres/1,000	Site
Neighborhood Park	Basic unit of the park system, developed for both active & passive activities. Design criteria should anticipate the changing demographic profiles of the neighborhood served, as to provide appropriate facilities. Focus on informal and unstructured activities. Typical facilities include: • Playground • Open field area • Trails • Parking evaluated as needed	1/2 mile radius	4 to 10 acres	2.5 to 3.5	Easily accessible to the neighborhood population with safe walking and biking access utilizing trail networks. Site should have well-drained soils and not include topography of excessively steep slopes.
Neighborhood Playfield	Similar to a neighborhood park, but with more emphasis on organized youth athletics. Provides active & passive activities. Design criteria should balance neighborhood and community youth athletic needs. Typical facilities include: • Playground • Athletic fields (lighting not recommended) • Trails • Parking facilities designed to accommodate scheduled athletic use.	1/2 to 1 mile radius	6.5 to 15 acres	2.5 to 3.5	Easily accessible to the neighborhood and the community with a mix of local and collector street access.
Community Park	Area possessing natural qualities conducive to passive recreational activities. Typical facilities include: • Playground • Picnicking facilities • Trails • Natural resources • Community facilities (special uses) • Parking facilities designed to accommodate uses	2 to 2.5 mile radius	20 to 80 acres	2.5 to 5	Site typically affords a variety of natural features, well-drained soils, positive drainage, varied topography and accessible to pedestrian and vehicular traffic.

Park Classification	Use/Design Direction	Service Area	Size	Acres/1,000	Site
Conservancy Lands	Area possessing natural qualities preserved for environmental, open space or aesthetic purposes. Facilities should be compatible with the preservation of the resource.	Community Wide	Depends on resource	Varies	Significant natural areas, which merit preservation and would be adversely, affected by development
Community Athletic Complex	Area for intensely programmed recreation facilities and uses. Typical features include: • Athletic fields - youth and adult (lighted) • Swimming pools and other special use facilities • Playground • Trails • Parking designed to accommodate uses.	Community Wide	25 to 80 acres	3.0 to 4.0	Site should be suited for intense development that is easily accessible to the population it is intended to serve. Located near high traffic areas such as schools and major thoroughfares, preferably in non-residential areas.
Linear Parks	Linear parks and open spaces developed for varying modes of recreational travel such as walking, biking, skiing, in-line skating, etc. or for preservation of wildlife corridors, streams, etc. Features include: • Trails	Site specific & Community Wide	Sufficient width for intended use. Minimum 30 feet wide	Variable	Built or natural trail corridors used to link parks, natural resource sites, and/or community facilities such as schools, libraries, and commercial areas. Certain uses such as wildlife corridors require sufficient width to ensure proper function.
Special Use	Highly specialized use area for community recreation facilities such as: • Community golf courses • Arenas • Gardens • Plazas • Pools • Community Center • Other specialized recreation uses	Community Wide	Variable	Variable	Site Specific
Historic Sites	Area set-aside for preserving and interpreting historical features such as landscapes and architecture. Features include: • Interpretive signs • Parking • Museum	Community Wide	Variable	Variable	Size should be adequate to provide support facilities such as picnic area, parking, etc.

Although park/school recreation areas are not City property, they are classified in the classification system as school lands offering active recreation opportunities for Inver Grove Heights residents even if on a limited basis. The City's park classifications for future growth areas are summarized in Table 6.2.

Trail Classifications

Trails in Inver Grove Heights are classified based on function, design and location. Trails are designed to serve differing users depending on their location. Trails are designed to connect neighborhoods, parks, schools and commercial areas. Some trails are used primarily for recreation and others for transportation purposes. Trails in Inver Grove Heights include use separated trails (parallel pedestrian and bicycle trails) within the same corridor, combined trails for both pedestrians and bikes, bike lanes (paved shoulder next to the street) and unpaved natural trails and special use trails (cross county ski, horse and snowmobile). Trail classifications and criteria are summarized in Table 6.3. The function and design of trails within parks will be determined as part of individual park master plans. A map of the City's existing trails can be found on Figure 6.2.

Table 6.3: Trail Classification

Trail Classification	Location and Use	Surface	Width	Slope	Notes
Class I - Separate pedestrian and bicycle trails.	Off-street	Bituminous or bituminous and concrete	5-6 feet for pedestrians 8-10 feet for bicycles	0-5% pedestrian 0-3% bike	
Class II - combined pedestrian and bicycle trail	Off-street	Bituminous	10 feet	0-3% average	
Class III - Bikeway lane	On-street - one way per side	Striped lane next to vehicle lane	8-10 feet	Slope to match road	One way lanes
Nature trail	Within parks and conservation areas	Aggregate, wood chip or turf	4-6 feet	0-5% desirable 10% maximum	
Cross country ski trail	Within parks and conservation areas	Snow	10-14 - varies for one or two way	0-15% + depending upon difficulty	Diagonal and skate tracks
Snowmobile trail	Off-street	Snow	10-14 feet	0-10%+	
Horse trail	Off-street	Turf or wood chips	10 feet	0-10%+	12 foot overhead clearance

General Park and Trail Criteria

Park classifications describe criteria applicable to each park type. The following park and trail criteria are applicable to all parks:

- The location of parks and trails will be determined by the City using the 2030 Parks, Trails and Open Space Plan as a guide.
- Parkland shall be suitable to its intended use. This means adequate size, parcel shape, soils, slope, access and relationship to adjacent land uses.
- Parkland shall be continuous and undivided by roadways, railroad tracks, pipelines, or other impassible or unusable barriers.
- Parkland shall be free from any contaminants or debris.
- Trail land shall be of sufficient width and slope to accommodate 10' wide trails and appropriate buffer areas. General guidelines include a minimum width of 20' – 30', a maximum slope less than 12 percent and an average slope not to exceed four percent.
- When park land is dedicated, the developer is required to grade the park land and pave access and perimeter trails (not internal park trails) and sidewalks within the park and adjoining rights of way. All construction must meet City specifications.

Where topographic constraints pose barriers to achieving the above criteria, the City encourages a collaborative design process to minimize the degree of deviation from these criteria.

Park System Needs

Introduction

There is no single standard or measurement to determine community parks and recreation needs. Each community is unique and has its own needs and opportunities. Inver Grove Height's park and recreation needs were determined through a public process that included community and stakeholder input; guidance from City staff, the Parks and Recreation Commission; and an analysis of the park system considering growth forecasts and recreation trends and using the Park System Framework. With 23 acres of parkland per 1,000 residents, Inver Grove Heights exceeds the standard benchmark for minimum park acreage per 1000 residents. An analysis of park service areas shows good access to parks and facilities from

most neighborhoods (see Figure 6.4 – Park Service Area Analysis). Both suggest that the City has done well to provide adequate parkland to meet neighborhood and community recreation needs. To continue this level of service in future residential growth areas, additional parkland is needed such as the NW area of the City.

Neighborhood Park Needs

Neighborhood Parks in Inver Grove Heights are the cornerstone of the park system providing passive recreation to neighborhoods within a safe half-mile walk for most residences in the urbanized portions of the city. Existing neighborhood parks are generally in good shape and serve the neighborhoods well. Based on the application of the Park System Framework to future growth areas, an additional four (4) Neighborhood Parks may be needed to accommodate neighborhood recreation needs of future residents in the Northwest Area, (see Figure 6.5: Northwest Area Park Service Areas Map). Typical neighborhood park amenities will be needed, although an opportunity exists to cater the parks to the character of the neighborhood and the site and to specific local needs. Community input suggests that the following improvements are needed in existing neighborhood parks:

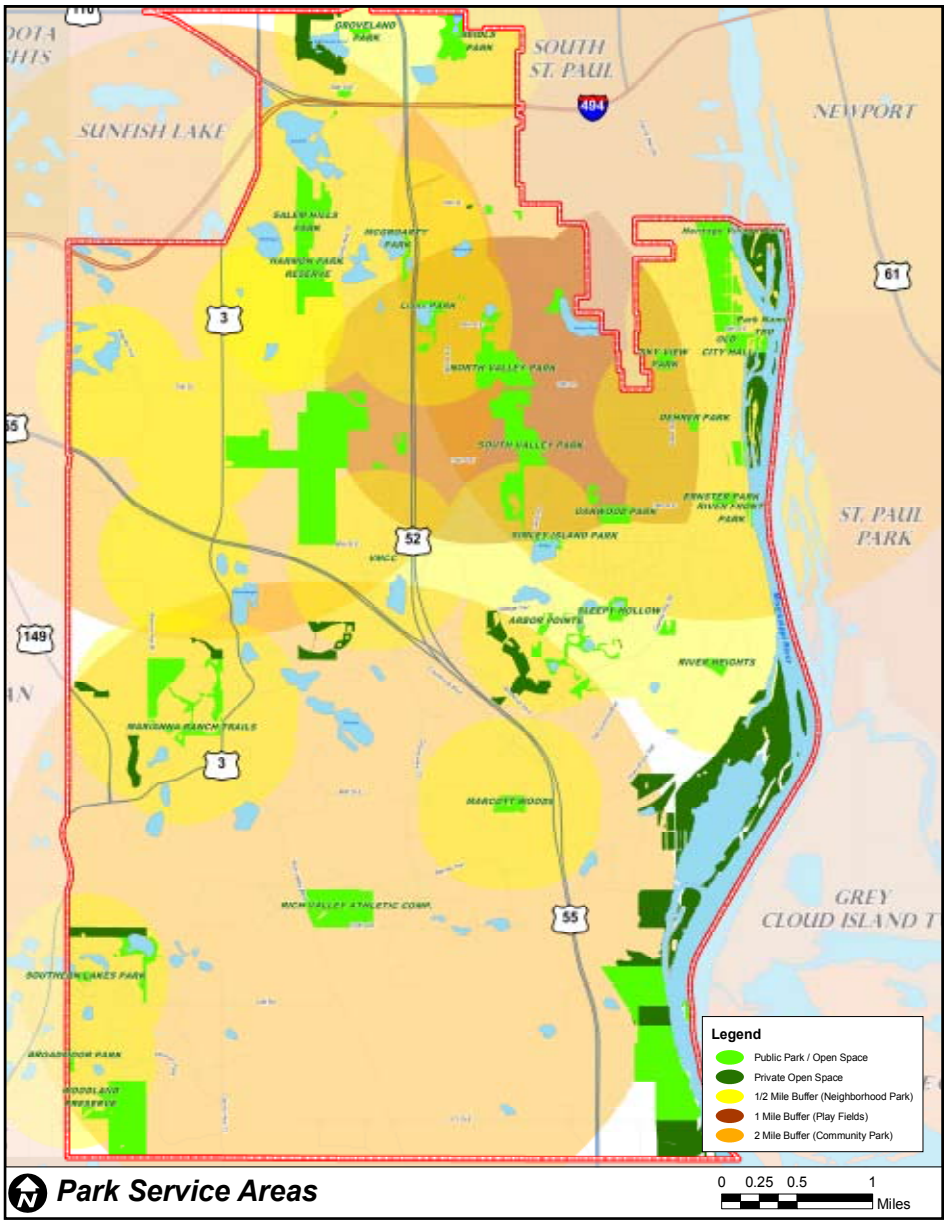


Figure 6.4 - Park Service Area

- Looped trails, shade and seating areas.
- Handicap accessibility improvements.
- Ongoing lifecycle replacement of playgrounds and facilities.
- Landscape improvements.

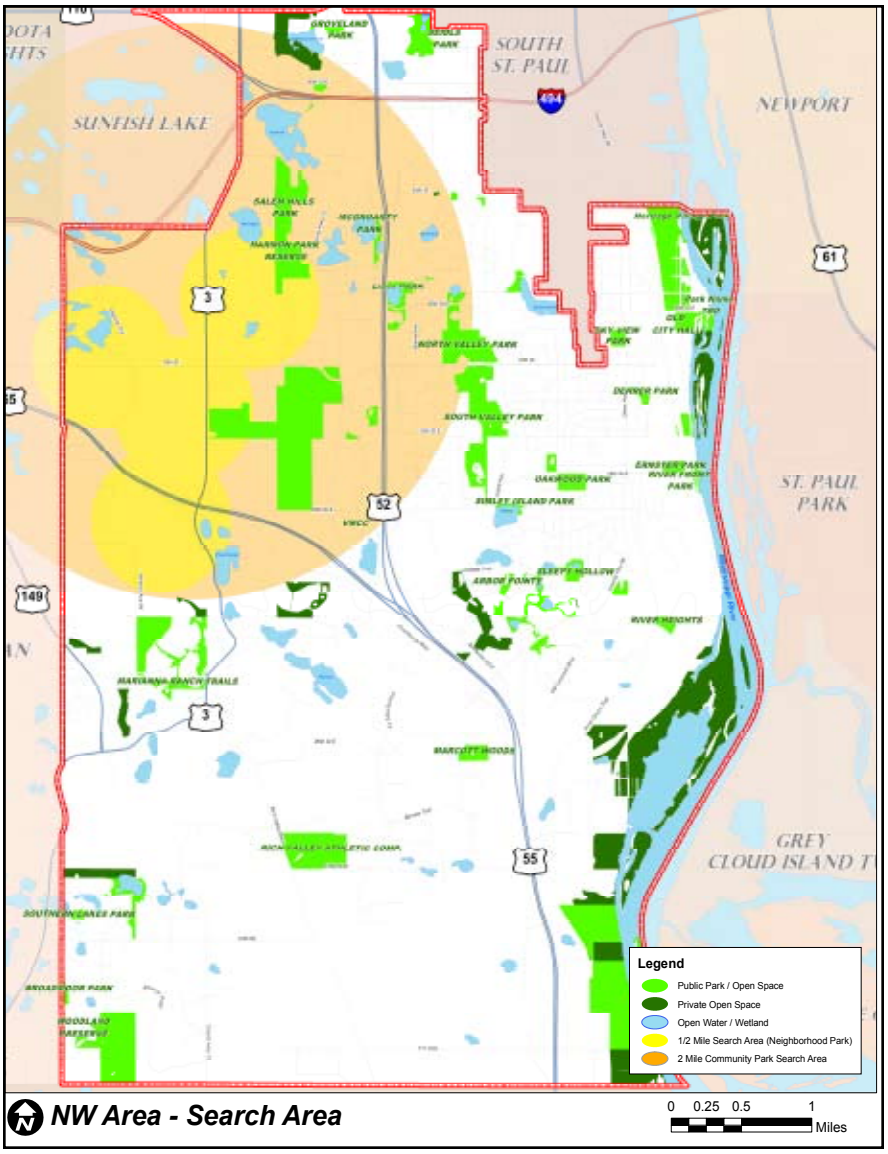


Figure 6.5 - Park Service Area Analysis: NW Area

Community Park and Recreation Facility Needs

The Rich Valley Athletic Complex and existing neighborhood playfields reasonably meet existing needs for community-wide active recreation. With growing participation in soccer, lacrosse, Ultimate Frisbee and the participation of girls in youth sports, the demand for athletic fields is growing. There is a need to maximize the use of the City's existing fields through lighting, irrigation, and scheduling improvements. There is also a need to acquire additional field space for community athletics. Based on the application of the Park System Framework to future growth areas, an additional community park is needed in the Northwest Area to accommodate the future community recreation needs of the area (see Figure 6.5 – Northwest Area Park Service Area Map). Community input suggests that the following community park and facilities improvements are needed:

- Youth Soccer/lacrosse/football fields.
- Disc golf area improvements.
- Paired volleyball courts for tournament play.
- Archery range.
- Outdoor aquatic facility.
- Dog exercise area.
- Public boat launch along the Mississippi River.
- Large community picnic shelters with electrical service and food serving area.
- Skills course for mountain bikes.
- Winter recreation (skating) in the northwest and southwest areas of the City.
- Accessibility improvements.

- Looped trails, seating areas and shade.
- Continued lifecycle replacement of existing recreation facilities.

Historic and Cultural Resources

Bridge 5600

The City has a rich history as a river community and the City's residents long for a physical and historical connection to its river history. The City has been acquiring land for the development of Heritage Village Park, a community park on the Mississippi River. The continued acquisition and development of the park, including the restoration of the Bridge 5600, will have the potential to satisfy much of the community's desire for a connection with its past. The City owns two historic structures, the old town hall and old school that if restored, could also provide places for historical and cultural interpretation. The continued development of the area with the provision for safe and convenient access to the park and supportive land use around it has the potential to activate the park increasing the opportunities for Inver Grove Heights residents to interface with the City's historic and cultural resources found in the area.

Bridge 5600 - Bridge Reuse Concept

Special Use Facilities

The park system contains two special use facilities that are popular with residents and serve important community recreation needs, the Inver Wood Golf Course and the Veterans Memorial Community Center. Both facilities need renovation and improvements to maintain profitability and to retain existing and attract new users. Improvement needs include:

- New program space.
- Potential alternative uses (multi-use) of ice sheets if skating participation declines.
- Aesthetic improvements.

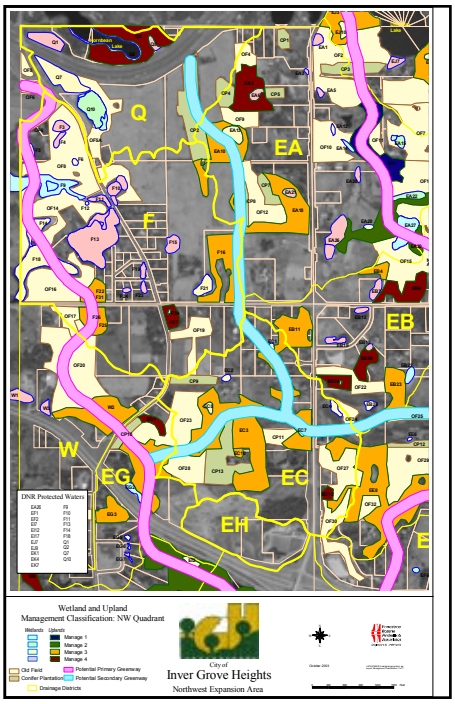


Figure 6.6 - NRI of NW Area

Open Space and Natural Resources

The City's conservancy lands provide open space and natural resource preservation for all residents. Open space and natural resources are valued by Inver Grove Heights residents and they have been identified as important to maintaining a healthy community. As the City develops into the Northwest Area, open space and natural resource preservation is needed to protect existing natural resources identified in the City's Natural Resources Inventory (NRI) and preserve areas for stormwater management (see Figure 6.6: NRI of NW Area).

The Mississippi River corridor is a vast natural resource that the City depended on for its very existence in the early days. Access to this resource is very limited in the City. The Mississippi National River Recreation Area is working with numerous partners to protect the natural resources of the river corridor and to provide continuous trail connections along it. The City should work cooperatively in these efforts and should work to create connections to the River at every opportunity.

Preserving Natural Resources (Harmon Landscape)

Community input suggests that there is a need for natural resource interpretation and education as a way to connect youth with the environment. The City's conservancy lands provide such an opportunity. Another opportunity is at the Katherine B. Ordway Natural History Study Area The City's last comprehensive plan suggested a cooperative agreement for public use of the Katherine B. Ordway Natural History Study Area. As the City grows it should explore all opportunities to provide natural resource education and interpretation, whether through a provision of interpretive signs in City parks and conservation lands, through a cooperative agreement to access the Macalester College site, or as a unique City facility dedicated for that purpose.

It is not enough to preserve open space and natural resources. Management of these valued resources is needed to protect them from degradation caused by invasive species, disease and deer browse. The City needs to develop and implement natural resource management plans as new open space is preserved.

Trail and Bikeway Needs

Trails are popular and use has boomed regionally and in Inver Grove Heights according to community input. Trails are used for safe and convenient access

to parks, open space, neighborhoods, commercial areas and destination beyond the City. A complete and connected trail system of trails and bikeways is highly valued by residents for leisure use and for transportation. Trails are important to maintain a healthy community and high quality of life.

Trail users have differing needs depending on their skill level and purpose for riding. Those riders with advanced skills most often ride for convenience and speed and want direct access to destinations with a minimum of detour or delay and are comfortable riding on roads with motor-vehicle traffic. Those riders of lesser skill level or riding for leisure will avoid high traffic areas and will more likely use routes with bike lanes, off-street trails or trails in parks and open spaces depending on the skill level. To accommodate the full range of trail users, there is a need to provide connectivity to destination in and outside of the City. To maintain active life-styles, the City needs a coordinated trail and bikeway network to provide non-motorized and recreation options.

There are three regional trails planned through the City. Future master planning for the Dakota South Urban Regional Trail and the Dakota North/ South Regional Trail provides an opportunity for the City to guide these trail routes through Inver Grove Heights. The City needs to actively work with the County to coordinate planning and construction of these trails.

Community input suggests the following trail and bikeway needs:

- A coordinated trail and bikeway network to provide non-motorized and recreation options.
- Develop the trail network into future growth areas.
- Provide better signage of the community's sidewalk and trail system.
- Work with Dakota County to develop master plans for regional trails in the City.
- Increase access to the Mississippi River and to the Dakota County Mississippi River Regional Trail.
- Trails to natural resources and open space.
- Trail connectivity to adjacent City's trail networks.

Sustainability Needs

The City of Inver Grove Heights, through its community vision is committed to the preservation and enhancement of its natural environment and to greater sustainability. The park system represents a visible opportunity to provide leadership in achieving greater sustainability. Opportunities for sustainability in the park system include:

Lion's Trail

Rich Valley Trail

- Develop new facilities in the park following Leadership in Energy and Environmental Design (LEED) standards.
- Consider life-cycle costs in the planning and development of park and recreation facilities.
- Restoration and management of the City's natural resources.
- Use native plants to reduce landscape maintenance requirements, to serve as a source of food and shelter for wildlife, to buffer shorelines, to control runoff and to manage geese populations.
- Seek biologic controls for invasive species.
- Explore greater use of pervious pavers and rain gardens in park projects.
- Develop natural resource and environmental interpretation/education component to City Parks and Open Spaces.

Healthy Community Needs

Part of the City's vision is for Inver Grove Heights to be a healthy active community. Such a community offers a balance of active and passive recreation options, is interconnected through a multi-modal transportation system including a component of off-street trails and bikeways, trails link community destinations such as parks, open spaces, places of work and shopping and to home, encourages walking with pedestrian environment that is attractive with looped walking routes. There is an opportunity for the park system to provide key components of this City goal through targeted improvements to parks, trails and open spaces.

Dakota County North/ South Regional Trail Search Corridor

The City of Inver Grove Heights recognizes the Dakota County's North/South Regional Trail Search Corridor as part of the Metropolitan Council's 2030 Regional Policy Plan. In our efforts to be consistent with those plans, we have indicated the search corridor on Figures 6.7 and 6.8. A specific alignment has not been defined at this time. The City will continue to collaborate with the Metropolitan Council, Dakota County and other agencies to resolve any differences in determining a specific alignment.

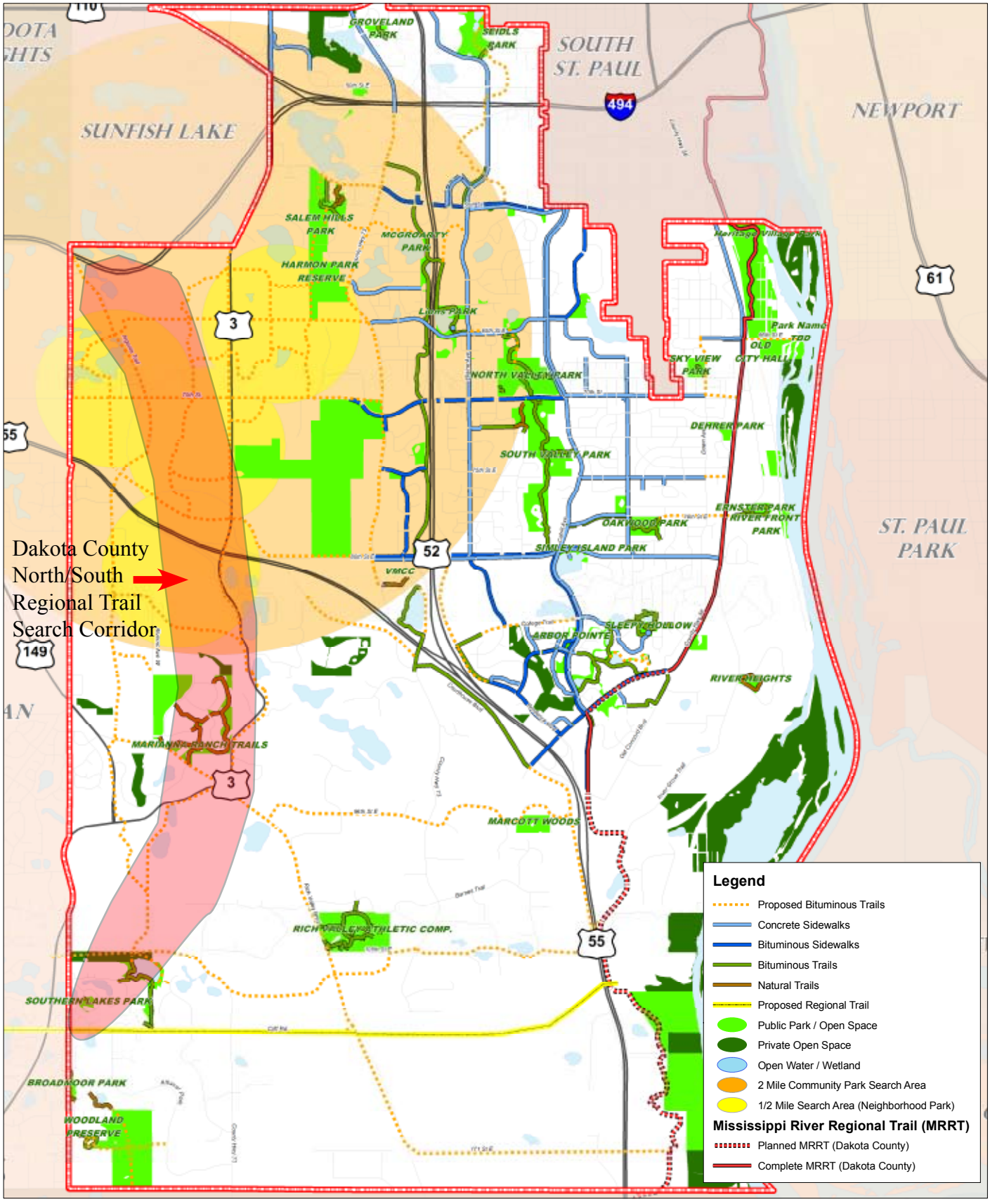
Parks System Plan

Introduction

A comprehensive park trail and open space system is a key element of a healthy community with a high quality of life. As The City of Inver Grove Heights grows in population and new areas of the City develop, additional recreational opportunities will be needed. This plan insures new residents will have access to quality neighborhood parks that are connected to a larger park network that includes Community parks and open spaces, and natural resources.

The 2030 Parks, Trails, and Open Space Plan, Figure 6.7 shows existing parks and trails and general locations of proposed parks and trails. The proposed

Figure 6.7: 2030 Parks, Trails & Open Space Plan (The proposed trail alignments are conceptual.)



2030 Parks, Trails and Open Space Plan

0 0.25 0.5 1 Miles

Active Recreational Uses

new park locations are designed to provide neighborhood recreation for future residential growth that are interconnected trails. Proposed new trails are designed to link neighborhoods to parks, to community resources and to create loop trail opportunities.

The 2030 Parks, Trails, and Open Space Plan is a guide to park system improvements and development of the park and recreation system to the year 2030.

Neighborhood Parks

Passive Recreational Uses

Four new neighborhood parks are proposed to accommodate the neighborhood recreation needs of future residential growth in the Northwest Area representing 20 - 40 acres of new park land. New neighborhood park search areas are shown on Figure 6.7: 2030 Park, Trail and Open Space map. These search areas represent an approximate location of future neighborhood parks that are intended to meet the needs of the specific neighborhood they generally serve within ½ mile walk with no barriers such as busy roads or large water bodies to inhibit park access. Neighborhood parks are also located to be connected by a system of trails that may include varying facilities and may incorporate natural features to create unique amenities in a neighborhood.

Neighborhood Park

Community Parks

One new community park is proposed to accommodate the community recreation needs of future residential growth in the Northwest Area representing 20 - 40 acres of new parkland. The Community Park Search Area shown on Figure 6.7: 2030 Park, Trail and Open Space map represents an approximate location of the future community park to meet the community park needs within a 2 mile distance – a distance that encompasses all of the Northwest Area.

Community Park

The City has and should continue acquiring parkland for the future development of Heritage Village Park, a community park with cultural and historical significance in the City. As the Heritage Village Park area redevelops, the City should encourage adjacent land uses and public improvements that will activate the park with people to create a vital place and destination in the community. Such improvements might include development of a retail hub with restaurants or other destination oriented gathering places around or near Heritage Park and an enhanced water front area that enables public access and improved pedestrian connections to adjacent neighborhoods

and the Concord Avenue commercial area. Currently, the area does have access to a private commercial marina.

Open Space & Natural Resources

The City's 2003 Natural Resource Inventory (NRI) of the Northwest Area was conducted to plan for the management, protection and enhancement of natural resources (see Figure 6.6: NWA NRI). The NRI identified and ranked existing natural resources according to ecological and local values. Opportunities for expanding open space areas should be explored to meet the community's desire for natural resource preservation.

Trail and Bikeways

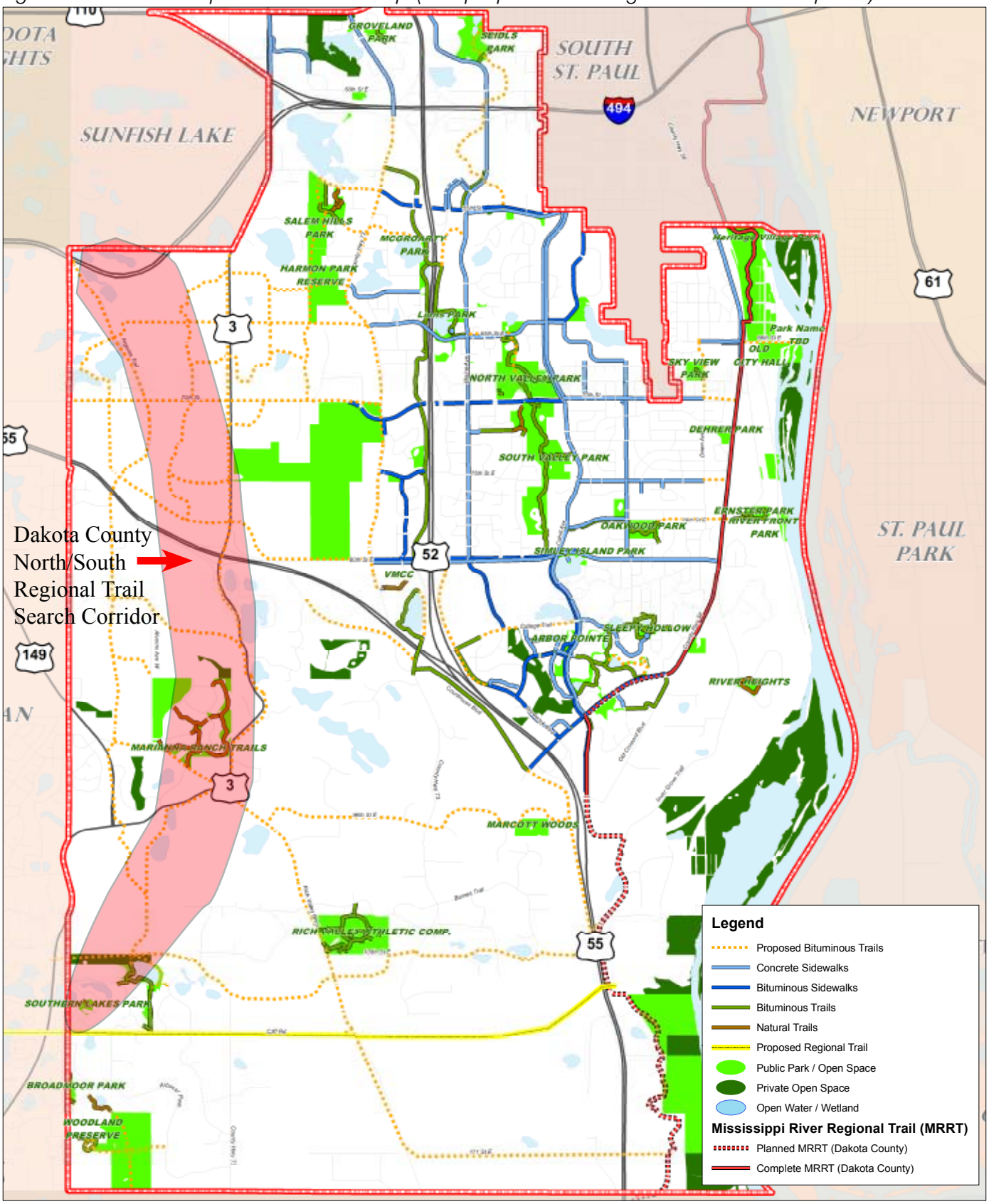
The Inver Grove Heights trail plan is a 20 year plan for a trails and bikeways in the City that will connect residents to parks, open spaces, schools, commercial areas and to regional trails and trails of adjacent communities. The plan suggests improvements to the Mississippi Regional Trail Corridor and the River, that provide access to natural resources and open spaces and trails that provide key connections to destinations in the City, to regional trails and to trail system of adjacent cities and new trails in the Northwest Area. New trails will promote a healthy active community and will accommodate a range of uses including walking, bicycling, in-line skating, etc., and a wide variety of trail user skill levels (see Figure 6.8: 2030 Comprehensive Trail Map).

Regional Trails

The Inver Grove Heights trail plan incorporates the three corridors identified by Dakota County, the Mississippi Regional Trail Corridor (MRRT), The South Urban Regional Trail and the North/South Regional Trail. A portion of the MRRT in Inver Grove Heights is scheduled for construction in 2008. There is a preferred alignment for the later phases. The City should continue to work with the County in the final planning and construction phases of the MRRT in Inver Grove Heights.

The South Urban Regional Trail has been identified by Dakota County as following Cliff Road from the Lebanon Hills Regional Park to the Mississippi River Regional Trail (MRRT). The Inver Grove Heights trail plan identifies a conceptual alignment for the South Urban Regional Trail that follows the highline out of Eagan to the Rich Valley Athletic Complex then follows 105th Street East to the Mississippi River Regional Trail (MRRT). Conceptual alignment of Dakota SURT. The City should work with the County to prepare

Figure 6.8: 2030 Comprehensive Trail Map (The proposed trail alignments are conceptual.)



2030 Comprehensive Trail Plan

0 0.25 0.5 1 Miles

a master plan for this alignment.

The Dakota County North/South Regional Trail search area is shown to connect Lebanon Hills Regional Park to the South Urban Regional Trail to Sun Fish Lake through Inver Grove Heights. A potential route for the regional trail is depicted on the trail master plan and the City should work with the County to develop this regional trail as development happens in the NW area.

As the City and the County develop master plans for each of the trails, active participation by adjacent property owners will help determine the final alignments. As the alignments are finalized, the City should enter into joint powers agreement between the County and Inver Grove Heights for each of the trails that outline management and maintenance responsibilities.

Equestrian Trails

Horse stables are prominent in some rural residential neighborhoods and the need exists for off-street riding areas. Lebanon Hills Regional Park in Eagan provides trails for horseback riding but until the South Urban Regional Trail is developed, there is no trail connection into Inver Grove Heights.

Because of limited public resources for equestrian trail development, trail construction in the near future may be completed by private entities such as trail clubs or a group of users. The City of Inver Grove Heights supports private trail development. It may be possible for private groups to reach an agreement with Flint Hills Resources to utilize some of the buffer land that surrounds the refinery for equestrian trails (see Figure 6.9: Flint Hills Buffer Area).

Figure 6.9 - Flint Hills Buffer Area

The Inver Grove Heights trail plan identifies trail alignments that are conceptual in nature. Their locations have been identified to achieve stated objectives such as connecting residential areas to local park facilities, open spaces, natural resources and other destinations. The actual locations of such trails shall be determined through negotiations and mutual agreements between land owners/developers and the City. The plan serves as a statement of policy that trail connections are desired in certain areas. Precise alignments that achieve this desired goal need to be the product of more detailed design.

VMCC Water Park

Community Recreation Facilities

The City's community recreation facilities are important to City residents and are key to providing a healthy active community. As such, the Comprehensive Plan Update envisions continuing the use of Inver Wood Golf Course as a public golf course. Improvements to Inver Wood Golf Course and Veteran's Memorial Community Center will allow each to better keep and attract members and guests. Improvement plans should be developed to improve aesthetics, provide alternative uses or multiple uses and provide community meeting and program space.

Natural Resources

Preserving and maintaining the City's natural resources are important to Inver Grove Heights residents. Access to natural resources is important to maintaining a healthy community. Natural resources exist on both City and private property. The City should continue to encourage the preservation and management of natural resources on private property through enforcement of City regulations, forestry and educational programs and communications. The City should develop management plans and utilize best management practices for the maintenance of natural resources on City property.

Additionally, the City should consider the development of a nature center or improvements to natural resource interpretation in the City. There is an opportunity for the City to partner with Macalester College for public use of the Katherine B. Ordway Natural History Study Area. The City might also consider making natural resource and interpretive improvements to the Harmon Nature Preserve. Within the existing developed City and future growth areas, there may be other natural resource areas that are worthy of preservation and interpretation. The following are two of many examples of nature centers in the Twin Cities area that could serve as models:

- Roseville's Harriet Alexander Nature Center in Central Park is operated by an independent, nonpolitical, nonprofit organization created to support the mission of the Nature Center with a Board of Directors that oversees the nature center operations and fund-raising efforts. Programming is paid for in part through membership dues and donations.
- The Oakdale Discovery Center is a City owned and operated facility providing a variety of nature exhibits and educational opportunities. The facility began as a nature center that was a converted home in Oakdale Park and is now a reconstructed facility with space for meetings,

programming, and nature interpretation in renamed Oakdale Nature Preserve.

- Pine Bend Bluffs Scientific and Nature Area is a Department of Natural Resources property in Inver Grove Heights. SNA's contain rare natural resources and in some cases provide parking facilities and interpretive kiosks to help visitors identify key features and processes for self guided tours.

The City should also encourage and support the development of private nature centers on private property as a means to preserve environmentally sensitive natural areas and further encourage residents to participate in nature-based activities and education.

An excellent example of such a private nature center is the Dodge Nature Center located in West St. Paul and Mendota Heights. Dodge has a diversified and beautiful area of prairies, hardwood forests, lakes, wetlands, miles of hiking trails, a working farm orchard and bee apiary. Dodge offers a variety of unique experiences for people of all ages. It has an expansive environmental education curriculum for children.

The Oakdale Discovery Center

Pine Bend Bluffs Scientific Nature Area

Crime Prevention Through Environmental Design (CPTED)

"CPTED is the proper design and effective use of the built environment which may lead to a reduction in the fear and incidence of crime, and an improvement of the quality of life." - National Crime Prevention Institute

Sustainability

Greater sustainability in the park system will be achieved by the incorporation of Leadership in Energy and Environmental Design (LEED) standards for new park buildings, consider life-cycle costs in the planning and development of park and recreation facilities, utilization of best management practices, such as the use of rain gardens, permeable pavers and other innovative stormwater retention techniques in new parks and park renovations and through use of native plants in landscaping. The City can provide leadership through enforcement of City regulations related to natural resources, through educational and recreation programming and by providing interpretation of natural resources in the City's parks and open spaces. Greater sustainability can be achieved by the development of a system of connected open spaces, or the preservation of natural resource areas.

Healthy Active Community

The park system is central to achieving a key goal of the City's comprehensive plan, to maintain a healthy active community. Priority should be given to park system improvements encourage greater use of the park system, that provide amenities for diverse park system users. Improvements should be made that provide increased public safety, such as those that utilize Crime Prevention through Environmental Design (CPTED) techniques to create safe and welcoming parks, trails and recreation facilities; improvements that

include amenities for a variety of age and skill levels; improvements that include looped trails of varying lengths and trails to provide access to natural resources and other key destinations in the City. Parks improvements should focus on providing places to rest with benches and shade that are spaced to serve all users with a variety of abilities.

The Four Strategies of CPTED

1. Natural Surveillance - A design concept directed primarily at keeping intruders easily observable. Promoted by features that maximize visibility of people, parking areas and building entrances: doors and windows that look out on to streets and parking areas; pedestrian-friendly sidewalks and streets; front porches; adequate nighttime lighting.
2. Territorial Reinforcement - Physical design can create or extend a sphere of influence. Users then develop a sense of territorial control while potential offenders, perceiving this control, are discouraged. Promoted by features that define property lines and distinguish private spaces from public spaces using landscape plantings, pavement designs, gateway treatments, and “CPTED” fences.
3. Natural Access Control - A design concept directed primarily at decreasing crime opportunity by denying access to crime targets and creating in offenders a perception of risk. Gained by designing streets, sidewalks, building entrances and neighborhood gateways to clearly indicate public routes and discouraging access to private areas with structural elements.
4. Target Hardening - Accomplished by features that prohibit entry or access: window locks, dead bolts for doors, interior door hinges.

Implementation

Park System Goals and Policies

In order to guide the future park system, the following park system policies have been adopted by the Inver Grove Heights Parks and Recreation Commission:

Planning Goals & Policies

The following planning goals and policies will guide the City of Inver Grove Heights.

Planning Goals & Policies

Planning Goals:

- Develop and adopt a Comprehensive Park and Recreation Plan based on the needs and demands of all segments of Inver Grove Heights's population.
- Locate parks when they are geographically, financially and physically feasible, and based on park and recreation needs.
- Coordinate the efforts of local, state and federal governments and agencies to plan and develop the Park and Recreation System.

Planning Policies:

1. The Park and Recreation Plan will seek to be compatible with adjacent local community plans and metropolitan, state and federal plans and programs.
2. Public school facilities and their recreation areas will be considered in the planning of the park and recreation system. Maximum cooperation, coordination and participation with school districts will be sought in the planning of the development and operation of the park and recreation system.
3. The description and standards established in the park classification system will be a basis for developing the park and recreation system.
4. Park and recreation services and facilities should be provided where recreational opportunity is deficient or non-existent. This will be done in conjunction with the resources of the volunteer-based organizations, Community Education and the private sector, where appropriate.

Park Goals & Policies

Parks Goals & Policies

The following park goals and policies will guide the City o f Inver Grove Heights.

Park Goals:

- Pomote park development that will best encourage and/or control use.
- Provide a well balanced park and recreation system.
- Strengthen the image of the Parks as a System which provides community services and recreational facilities.

Park Policies:

1. Offer a variety of activities in the park system including cultural, conservation, passive, active and organized recreation areas.
2. Acquire parkland and develop existing parks at a rate and level commensurate with the needs of Inver Grove Heights's changing population.
3. Establish and promote high quality design standards in the development of the park system.
4. Encourage joint use of facilities by incorporating school facilities with park and recreation programs whenever possible.
5. Encourage multi-use park facilities that will maximize accessibility and use by area residents.
6. Allow the conversion of park and public open lands to other uses only when no feasible alternative exists and community needs are not compromised. When conversion is unavoidable, the taking agency should pay for the replacement of land and facilities to serve the needs of the people in that area.
7. Specific park development priorities will be discussed, reviewed, analyzed and measured for progress annually.
8. Ongoing information and education process will be conducted, making the residents aware and knowledgeable of park and recreation facilities and programs.
9. Parkland will be acquired in accordance with the Comprehensive Park Plan and Development Guide.
10. Require a park dedication from all developers pursuant to City Ordinance.
11. Wetlands and storm water ponding areas will not be accepted as fulfillment of park dedication requirements.
12. Provide public access into City park areas by a variety of transportation means.

13. A consistent signing policy will be developed for all park and recreation areas buildings, etc., including directional and information signs.

Trail System Goals & Polices

The following trail system goals and policies will guide the City o f Inver Grove Heights.

Trail System Goals & Policies

Trail System Goals:

- Promote safe, convenient and coordinated facilities for alternative means of transportation throughout the City of Inver Grove Heights.
- Provide Inver Grove Heights residents with sections of trail that focus on recreational value and harmony with the natural environment.

Trail System Policies:

1. Coordinate the use of a citywide trail plan.
2. Plan bicycle and pedestrian access to parks, open space areas, schools and neighborhood shopping areas to encourage maximum use of these facilities.
3. Encourage the utilization of utility easements and transportation right-of-ways for trail development.
4. Provide ramped curbs to meet accessibility standards and to accommodate bicyclists.
5. Trails should be bituminous or concrete, except in nature areas, and be multi-use facilities when uses are compatible.
6. Trails will be integral to larger scale development and will be installed and paved at the developers' expense. These trails should connect to the existing and proposed extensions of the Inver Grove Heights trail system.
7. Inver Grove Heights trail system will be coordinated with the trail systems for Dakota County, surrounding cities and Metropolitan Council.
8. All existing and proposed trails should be mapped, reviewed and updated annually.
9. Off street trails will be coordinated with the future location of on-street bikeways (bike lanes) to create an integrated non-motorized recreation and transportation system.

Natural Resource/Open Space Goals & Policies

The following natural resource/open space goals and policies will guide the City of Inver Grove Heights.

Natural Resource/Open Space Goals & Policies

Natural Resource/Open Space Goals:

- Preserve and protect the natural environment with emphasis on the conservation of needed and useful natural resources for the present and future benefit of the community.
- Use natural resource areas to provide an overall open space system to satisfy the physiological and psychological needs of the people, considering their needs as individuals and as a community.

Natural Resource/Open Space Policies:

1. Conserve a variety of natural resource areas including wetlands, soils, ground water recharge areas, woodlands, lakeshore, drainage ways and steep slopes.
2. Encourage the assistance of metropolitan, state, and federal agencies to, where appropriate, preserves natural resource areas.
3. Open space areas should be used as a structuring element linked to other park and open space areas within projects and from one project to another, whenever possible.
4. Natural resource open space can be used to physically separate elements, which are incompatible, by scale or function.
5. Preserve natural drainage ways and wetlands and where feasible, reconstruct former natural drainage ways and wetlands to handle storm water runoff.
6. Encourage the use of contained storm water systems that treat the water on-site as much as possible.
7. To establish, maintain or restore natural conservation areas for wildlife management and educational and scientific purposes.

Sustainability Goals & Polices

Sustainability

The following sustainability goals and policies will guide the City o f Inver Grove Heights.

Sustainability Goals:

- To be a leader in sustainability and natural resources management.

Sustainability Policies:

1. Encourage new park buildings to be constructed using LEED (Leadership in Energy and Environmental Design) standards.
2. Parks will have recycling receptacles in addition to trash receptacles.

3. New facilities and significant renovation of existing facilities include a sustainability evaluation of materials, energy use, operating cost and lifecycle replacement.
4. Innovative stormwater retention techniques should be utilized in new park development and in the renovation of existing parks, such as permeable paving and rain gardens.
5. Native plants, such as prairie plantings, should be used in parks and open space to reduce landscape maintenance requirements, to provide food and shelter for wildlife, to buffer shorelines, to control runoff and to manage geese populations.
6. A natural resource and environmental interpretation/education component will be developed for City parks and open spaces.
7. Natural resource management plans will be developed for the preservation of natural resources in City parks and open space.
8. The City should implement an "adopt-a-park or open space" program to encourage community involvement in park maintenance and safety.

Healthy Community Goals & Policies

The following healthy community goals and policies will guide the City of Inver Grove Heights.

Healthy Community Goals & Policies

Healthy Community Goals:

- To promote active healthy living for all.

Healthy Community Policies

1. The Parks and Recreation Commission asks that park users refrain from smoking and tobacco use in parks.
2. Ensure convenient and equitable access to parks and recreation facilities by locating new parks within ½ mile of all residents
3. Special attention should be given to park and open space improvements that provide for handicap accessibility consistent with the Americans with Disabilities Act Accessibility Guidelines for Building and Facilities and universal design principles.
4. Special attention should be given to parks and open space improvements providing seating, shade and a trail loops of varying lengths to encourage active living for an aging population.
5. Special attention should be given to providing safe walking and biking routes to schools from neighborhoods.
6. The City will provide bicycle parking at park system destinations to encourage bicycle use.

7. To encourage the financial assistance of metropolitan, state, and federal agencies and non-profit organizations to fund healthy active living initiatives.
8. The City will implement the 2030 trail system plan.
9. That public safety improvement will be made as needed utilizing Crime Prevention through Environmental Design (CPTED) principles to ensure park and trail user's well being.
10. Demonstrate and encourage healthy choices by offering nutritious foods in park vending and at events.
11. Promote the benefits of Active Living through Parks and Recreation Department communications.

Sanitary Sewer

CHAPTER 7

Introduction

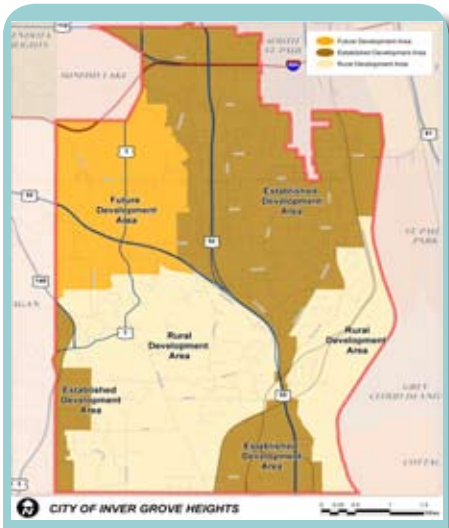
To accommodate projected growth, the City of Inver Grove Heights initiated an update to the 1998 Comprehensive Sanitary Sewer Plan in conjunction with the City's 2008 Comprehensive Plan and in accordance with Minnesota Statute 473.513. The purpose of this plan element is to serve future development and to identify existing system facilities and deficiencies.

Sanitary sewer flows for the City of Inver Grove Heights are projected through the year 2030 based on the land use plan and development projections described in Chapter 2. The potential 2030 service area was defined as areas that can be feasibly served by sanitary sewer in the future and was based on the Land Use Plan prepared for the City's 2008 Comprehensive Plan. The 2030 service area for the City is considered to be the full build-out of the proposed urban service area. Based on the 2030 service area, sanitary sewer districts and sub-districts were defined. Existing and future sanitary sewer flow rates were calculated for each sub-district based on the respective land uses. Projected sanitary sewer flow rates were used to analyze the existing trunk system capacity and size future trunk system facilities.

Future trunk improvements were defined with the intention that the trunk system would serve the 2030 service area. An approximate layout of potential trunk system improvements is included in this chapter of the Comprehensive Plan. Future improvements were incorporated into a Sanitary Sewer Capital Improvement Plan (CIP).

Metropolitan Council Environmental Service (MCES)

MCES exists to support the Metropolitan Council's mission by protecting the public health and environment and providing its customers efficient and effective water resources management.



The above diagram represents three planning areas: 1) Future Development Area (NW Area), 2) Established Development Area, 3) Rural Development Area

Data Available

In preparing this report, the following sources of information were utilized:

- Existing Sanitary Sewer GIS Information provided by the City of Inver Grove Heights.
- Sanitary Sewer Asbuilts provided by the City of Inver Grove Heights
- City of Inver Grove Heights Comprehensive Sewer Policy Plan, dated 1998
- MCES Sanitary Sewer Design Peaking Factors
- MCES Metering Data
- MCES System Statement for City of Inver Grove Heights

Metropolitan Urban Service Area (MUSA)

The MUSA designates areas either currently receiving urban services (i.e., sewer service) or that are scheduled to receive urban services within the next 20 years. It is important to note that the boundary for the MUSA is subject to ongoing adjustments that respond to changes in local comprehensive plans and projected service needs (Source Met Council).

Existing City Sanitary Sewer System

The purpose of the sanitary sewer element of the Inver Grove Heights Comprehensive Plan is to serve as a guide for the expansion of the existing trunk sanitary sewer system. The report deals primarily with the conveyance facilities required to collect the wastewater from the MUSA Expansion Area and transport it to the MCES Central Interceptor. It presents an overall trunk layout for the MUSA Expansion Area.

Typically, sanitary sewer systems consist of two elements: collection and treatment. Collection systems include sewer services, trunk sewer pipe, manholes, lift stations, and forcemains which collect the sewer flows from private residential, commercial, and industrial properties within the city. Treatment systems include the biological or chemical treatment in order to remove targeted contaminants from the wastewater.

The City of Inver Grove Heights's existing sanitary sewer system is a collection system only; the Metropolitan Council Environmental Services (MCES) provides treatment for Inver Grove Heights's sanitary sewer flows. MCES is also responsible for major trunk facilities conveying wastewater across City boundaries to regional treatment facilities. All wastewater flows from the City of Inver Grove Heights enter the MCES Interceptor system and is conveyed to the MCES Metropolitan Wastewater Treatment Plant (WWTP) located in the City of St. Paul, directly adjacent to the Mississippi River.

The sanitary sewer service area is defined as the area from which wastewater flows are collected by the City's sewer system. Based on the 2030 Land Use Plan the existing service area within the City of Inver Grove Heights is

comprised of approximately 8,611 gross acres which includes the lakes, wetlands, open park land, and road right-of-ways. This service area is shown on Figure 7.1 Eleven sanitary sewer service districts were developed within the City boundaries based on trunk gravity service and lift station service areas. The existing service area is partially developed within several districts.

The existing gravity sanitary sewer system is in good overall condition. The City conducts video inspection of sanitary sewers to identify portions that need rehabilitation. Since 2005, 48,000 feet of sewer have been so inspected. The City annually rehabilitates approximately 1700 feet of sanitary sewer using cast- in- place pipe.

The City of Inver Grove Heights's sanitary sewer system includes six lift stations ranging in capacity from 20 gallons per minute (gpm) to 75 gpm depending on the development demand within the service area.

The locations of the existing lift stations are shown on Figure 7.1. Table 7.1 below summarizes capacity information for each of the existing lift stations:

Table 7.1: Existing Lift Station Information

Lift Station Area	Year of Construction	Pumping Capacity (gpm)
River Road	1971	50
Doffing Avenue	1971	75
Forest Haven	1987	75
70th Street	1999	20
Whistletree Woods	2003	50
Pine Bend	2007	35

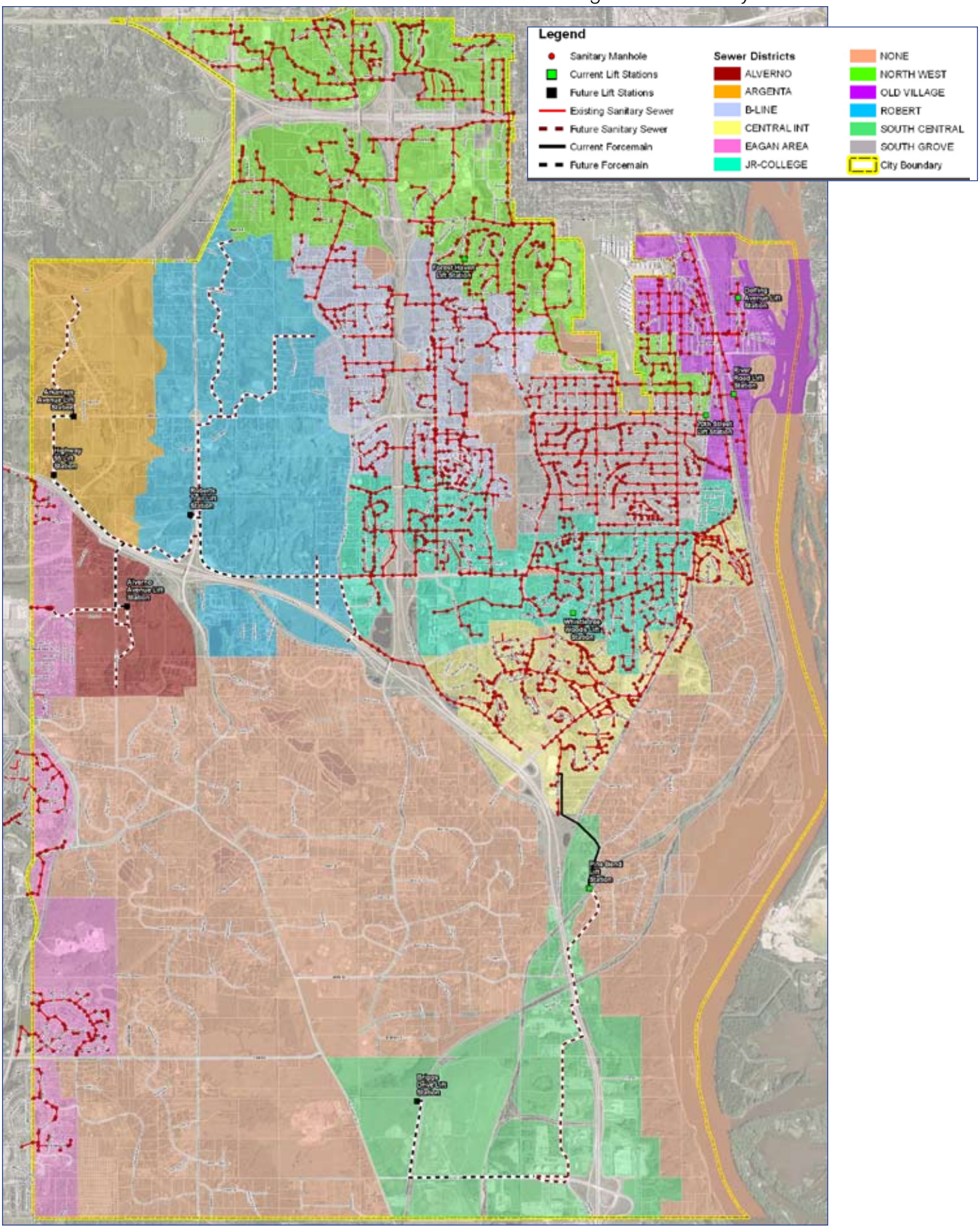
ISTS Maintenance

The City adopted a revised ordinance, Ordinance 911, relating to individual sewage treatment systems (ISTS) on January 26, 1998. That ordinance requires residential and commercial/ industrial properties to inspect or pump their systems every three years. The City uses the Dakota County's ISTS tracking and data base information for this maintenance program.

Individual Sewage Treatment Systems (ISTS)

A portion of the City is currently served by ISTS constructed and maintained privately. The areas are primarily located in the northwest and southern parts of the City. There are approximately 1,668 existing ISTS within the City. An annual report is produced and reported to the Metropolitan Council. The City has a monitoring and maintenance program that ensures the systems are properly maintained on a regular basis.

Figure 7.1: Sanitary Sewer & Sewer Districts



Existing Estimated Sanitary Sewer System Flows

The MUSA Area is divided into eleven major sewer districts. The sewer districts and the estimated existing wastewater flow generated from each sewer district are presented in Table 7.2. The districts are shown on Figure 7.1.

The existing sanitary sewer system's capacity to convey existing wastewater flows to the MCES collection system was analyzed by identifying existing land use areas within each sewer district and comparing estimated flows to actual metered flows from MCES. Existing system as-built information was used to determine system capacity. Average day and peak flows were calculated by determining the existing developed area in each district, area of each existing land use, number of existing units, and assuming a flow generated for each land use. The flows were calibrated by reducing the flow generated for each land use until the total system flow matched existing sewer flows metered by MCES. All trunk sanitary sewer mains exhibited adequate capacity for the existing system flows.

Table 7.2 : Sewer Districts and Estimated Existing Wastewater Flow

Sewer District	Average Flow (Million Gallons per Day [MGD])	MCES Design Peak Flow Factor	Design Peak Flow (MGD)
B-Line	0.333	3.6	1.20
Central Int	0.275	3.7	1.02
Eagan Area	0.166	3.9	0.65
Junior College	0.520	3.4	1.77
North West	0.702	3.3	2.32
Old Village	0.092	4.0	0.37
South Grove	0.225	3.8	0.86
Alverno	0	0	0
Argenta	0	0	0
Robert	0	0	0
South Central	0	0	0
Total Existing System Flows	**2.313**	**2.8**	**6.48**

Table 7.3: Land Use Breakdown

Land Use Designation	Abbreviation
Public Open Space	PUOS
Public/Institutional	P/I
Neighborhood Commercial	NC
Community Commercial	CC
Regional Commercial	RC
Light Industrial	LI
General Industrial	GI
Industrial Office Park	IOP
Rural Density Residential	RDR
Low Density Residential	LDR
Low Medium Density Residential	LMDR
Medium Density Residential	MDR
High Density Residential	HDR
Office	O
Mixed Use	MU
Private Open Space	PROS
Right of Way	ROW
Railroad	RR
Open Water/ Wetland	W

Land Use Breakdown

The current and ultimate land use plan for the City of Inver Grove Heights is described in chapter two of this Comprehensive Plan. Land use is a critical factor in determining future sanitary sewer alignments and sizes due to the fact that different land uses generate different wastewater flow rates. Table 7.3 presents the current City land use breakdown and the associated abbreviations:

The total area within the City of Inver Grove Heights is approximately 30 square miles or 19,153 acres, including wetlands and undevelopable area. Areas considered undevelopable are lakes, wetlands, protected open space, existing parks, right-of-way, and railroad. For sewer planning purposes, land that is currently not served by sanitary sewer is considered not developed. Inver Grove Heights has a considerable area in the southern portion of the City that is expected to remain Rural Residential that will not be served by sanitary sewer.

Sanitary Sewer Districts

To develop the future sanitary sewer trunk system, the 2030 potential service area was divided into major service areas or districts. Generally the selection of these larger district areas is governed by existing topography and/or other existing features such as roadways. The 2030 potential service area for Inver Grove Heights is divided into eleven major sanitary sewer districts. Figure 7.1 shows the major sanitary sewer districts. The following sections describe the major sanitary sewer districts; future improvements to serve the undeveloped districts will be discussed in a later Section of this chapter. Generally, all of the districts are sufficiently served for existing sanitary sewer needs.

B – Line District

The B–Line Sanitary Sewer District is located on either side of US 52 essentially between 60th and 75th Streets. The majority of the area within this district is currently developed and serviced with sanitary sewer. Future development potential includes infill low density residential and office development along US 52. This district was built in the early 1980's, consisting of RCP and VCP pipe with sizes ranging from 8" to 18".

Central Int District

The Central Int Sanitary sewer district is a wedge shaped district located west of Concord, east of US 52, and South of College Trail \ Delaney Drive. The district has some infill development potential remaining and is anticipated to be fully developed by 2030.

Eagan Area District

The Eagan District is located south of Highway 55 and to the west of Argenta Trail extending to the southerly City limits. An existing Joint Powers Agreement between the Cities of Eagan and Inver Grove Heights enables flowage from Inver Grove Heights into the Eagan system. Future development within the Eagan Area District will require evaluation against the Eagan sanitary sewer collection system and consistency with the existing joint powers agreement.

Junior College District

The Junior College sanitary sewer district is located east of Babcock Trail, west of Concord Boulevard, generally north of College Trail, and generally south of 75th and 78th Streets. There is an additional area west of Concord Boulevard, bounded by Dickman Trail and Royal Avenue. A limited amount of infill residential development is anticipated in this district over the next 20 years.

North West District

The North West Sanitary sewer district is located in the northernmost part of the city and surrounds the South St. Paul airport. The area has already been developed to a great extent, however, significant areas remain vacant and are anticipated to develop over by 2030 as market pressures grow for commercial development.

Old Village District

The Old Village Sanitary sewer is located between the airport and the river in the northeast corner of the city, extending as far south as 72nd Street (extended). This district is fully developed and is beginning to experience redevelopment pressures which will demand future sanitary sewer usage. The capacity of the existing 8-inch sanitary sewer is sufficient for carrying the projected wastewater flows in this district.

South Grove District

The South Grove District is located east of Cahill Avenue, west of Concord Boulevard, north of 77th Street, and south of 68th Street. This district is expected to expand minimally to serve projected Medium Density Residential development in the northwest portion of the sewer district, along with Regional Commercial and Industrial Office Park development in the central part of the sewer district and Low Density Residential development in the southern part of the sewer district. The capacity of the sanitary sewer is sufficient to handle the additional wastewater flow generated from projected growth.

Alverno District

The Alverno District is located to the south of Highway 55 and to the west of South Robert Trail. The area is largely undeveloped with the exception of a few established large lot residential neighborhoods. This area is planned as low-density, low-medium density, and medium-density residential. This area is currently not serviced. Existing homeowners have their own individual septic systems.

Argenta District

The Argenta District is located to the west of South Robert Trail and to the north of Highway 55. Currently there is no existing sewer service to this area. The existing homes have their own individual septic systems. The district is primarily undeveloped and planned for low-density residential development except for the areas bordering both Highway 55 and Interstate 494, which are planned for commercial/office/industrial land uses. This district is anticipated to absorb much of Inver Grove Heights new development by 2030.

Robert District

The Robert District is located to the east and west of South Robert Trail. This district is primarily undeveloped except for the rural residential area currently located in the northeast and southwest corners of the district. These homes have individual septic systems. The district is planned to be mostly low-density residential with the exception of the existing golf course, the commercial/industrial areas located along Highway 55, and the mixed use at the intersection of South Robert Trail and 70th Street West (Co. Rd. 26). This district, like Argenta, is also anticipated to absorb a significant amount of Inver Grove Heights new development to 2030.

South Central District

The South Central District is located east and west of Highway 52 and generally to the south of the Chicago & Northwestern Railroad and north of the City of Rosemount Boundary. Light and general industrial development is planned for this sewer district. The South Central Sewer District will be served by a trunk sanitary sewer line that will extend south from the Pine Bend Lift Station along Highway 52 and Clark Road to 117th Street. The trunk sewer line has been designed, bid and will be constructed as the Southern Sanitary Sewer Improvements project by 2009.

Table 7.4 Gross and Developable Land Area by Sewer District

Sewer District	Vacant-Developable Land Area (Acres)	Gross Land Area (Acres)
ALVERNO	329	425
ARGENTA	512	769
B-LINE	102	1,195
CENTRAL INT	67	796
EAGAN AREA	102	588
JR-COLLEGE	20	1,191
NORTH WEST	128	1,982
OLD VILLAGE	84	634
ROBERT	836	1,679
SOUTH GROVE	2	662
Grand Total	2,182	9,923

Growth Projections

It is assumed that as development occurs within the urban service area, sanitary sewer service will be extended to the new development. Sanitary sewer service will also be extended to current developments within the urban service area based on need such as specific property owner request. Sanitary sewer service would only be extended to new developments and existing developments that are located within the urban service area which is consistent with the City's Growth Management Policies as outlined within the Land Use Section of the Comprehensive Plan.

Historical growth data for the City is included in Table 7.5.

Table 7.5: City of Inver Grove Heights Historical Growth (Total City Growth)

Year	Population	Total Households	Employees
1970	12,148	NA	NA
1980	17,171	5,551	2600
1990	22.477	7,803	5724
2000	29,751	11,355	8,168

Table 7.6 below shows the assumed residential population growth and sewered population through the year 2030 from the City of Inver Grove Heights population projections.

Table 7.6: Sewered Population / Household / Employment

Year	2000	2010	2020	2030
Sewered Population	27,371	31,073	37,550	43,970
Sewered Households	10,286	12,847	15,761	17,904
Sewered Employment	8,168	12,000	14,700	17,900

Source: Hoisington Koegler Group Inc.

Estimated Flow Generation Rates

Future sanitary sewer flows, in conjunction with available slope, govern the capacity of sanitary sewers. To determine future sanitary flows, existing water demand and MCES recommendations were considered. MCES typically estimates 274 gallons per day per connection (gpd/conn) when calculating sewer availability charge (SAC) units. However, 75 gallons per capita per day (gpcd) is an estimate used by MCES to approximate actual design sewer flows for residential estimates and 800 gallons per acre per day (gpad) for non-residential developments.

Total existing City wastewater flows are not measured for individual users; the total flows are only measured by MCES based on the connections to the system. Wastewater flows are therefore not categorized by land use type. Typically in communities, the average wastewater flow is approximately 70% of the water demand; which accounts for losses occurring largely due to lawn watering.

Municipal wastewater is made up of a mixture of domestic sewage, commercial and industrial wastes, groundwater infiltration, and surface water inflows. With proper design and construction, groundwater infiltration and

surface water inflows, often called Infiltration/Inflow (I/I), do not become a significant percentage of the total flow. In accordance with MN rules 4715, the City prohibits the connection of roof and foundation drains to the sanitary sewer system.

The design flows described in Table 7.7 incorporate an allowance for extraneous water entering the sanitary sewer system through infiltration and inflow (I/I). The City has taken numerous steps to minimize I/I. These steps include stringent testing of all new sanitary sewer lines, use of manholes with concealed pick holes, and proper maintenance of the existing system, including a regular program of manhole leak detection and sealing. The City also prohibits the connection of roof and foundation drains and sumps to the sanitary sewer system.

The anticipated average wastewater flows from the various districts were determined by applying unit flow rates to each of the land use categories. The unit flow rates used are presented in Table 7.7.

Infiltration and Inflow (I/I)

Infiltration is clear water that enters the sanitary sewer system through defects in the sewer pipes, joints, manholes, and service laterals. Water that enters the sewer system from cross connections with storm sewer, sump pumps, roof drains, or manhole covers is considered inflow.

Residential Flow Rates

To determine the residential flow generation rates in gallons per gross acre several factors were reviewed and several assumptions made. As discussed previously, MCES typically uses 75 gpcd.

Non-Residential Flow Rates

Non-residential wastewater generators consist of Business Park, Commercial, Industrial, Mixed Use, and Public/Semi Public land uses. The assumption for non-residential users for overall planning is 800 gpad based on MCES recommendations and historical water usage.

It is possible that a large user could develop within the system; therefore, some laterals may need to be increased in size at the time of construction. The cost to install larger laterals has not been accounted for as a part of this plan. These developments would need to be reviewed on a case-by-case basis as the development occurs.

Peak Flow Factors

The sanitary sewer system must be capable of handling the anticipated peak wastewater flow rate including any I/I. The peak wastewater flow rate can be expressed as a variable ratio applied to the average flow rate. Curves used

Table 7.7: Wastewater Unit Flow Rates

Land Use Description	Gallons/Acres/Day
Public/Institutional	800
Neighborhood Commercial	800
Community Commercial	800
Regional Commercial	800
Light Industrial	800
General Industrial	800
Industrial Office Park	800
Low Density Residential	675
Low Medium Density Residential	1,015
Medium Density Residential	1,350
High Density Residential	2,025
Office	800
Mixed Use	800

to describe this peak flow factor (PFF) indicate a decreasing ratio of peak flow to average flow with increasing average flow. MCES peaking factor were used to determine peak hour flows for Inver Grove Heights. These values are generally conservative and widely used throughout the Metro Area for municipal planning. They include a standard allowance for I/I, which is typical of new sanitary sewer construction or properly operating existing sewers.

Infiltration and Inflow (I/I)

The quantity of I/I entering a wastewater collection system can be estimated utilizing wastewater pumping records, daily rainfall data, and water usage characteristics. Water from inflow and infiltration can consume available capacity in the wastewater collection system and increase the hydraulic load on the treatment facility. In extreme cases, the added hydraulic load can cause bypasses or overflows of raw wastewater. This extra hydraulic load also necessitates larger capacity collection and treatment components, which results in increased capital, operation and maintenance, and replacement costs. As sewer systems age and deteriorate, I/I can become an increasing problem. Therefore, it is important that I/I be reduced whenever it is cost effective to do so.

The MCES has established wastewater flow goals for each community discharging wastewater into the Metropolitan Disposal System (MDS) based on average day flows and allowable peaking factors. These enforced wastewater flow goals are aimed at reducing excessive I/I within the City's sanitary sewer system and also the MCES interceptor system. In February 2006, MCES adopted an I/I Surcharge Program which requires communities within the MCES service area to reduce or minimize excessive I/I over a period of five years. In the case that communities exceed the wastewater flow goals set by MCES during the five-year surcharge period, the community will be assessed a surcharge for flows above the goal. The surcharge is based on an exceedance rate of $350,000 per MGD above the MCES wastewater flow goal. Communities will only be charged for the highest single event during the five-year period.

The City of Inver Grove Heights currently does not have an I/I problem and is not part of the MCES I/I Surcharge Program. The City does recognize the importance of I/I and monitors it on a regular basis.

Hydraulics and Pipe Material

The trunk sewer system was laid out to prevent surcharging and maintain a minimum flow velocity of 2 feet per second at design peak flow.

It is recommended that the City of Inver Grove Heights institute a yearly pipe-cleaning program for trunk lines and lateral systems to maintain the

hydraulics of their system and prevent any buildup of sediment in the pipes. This will be especially important for larger pipes with relatively flat slopes. During flows less than design peak flows, velocities may fall below 2 feet per second, resulting in sediment accumulation in the pipes. If this material is not removed, pipe capacity will be reduced and corrosion problems could develop.

It is recommended that the City of Inver Grove Heights institute a yearly pipe-cleaning program to maintain the hydraulics of their system and prevent any buildup of sediment in the pipes.

Future Sanitary Sewer System

Wastewater Flow Projections

Wastewater flow projections were generated for each sanitary sewer district based on the net developed acreage available, anticipated land uses, and wastewater flow generation rates. The wastewater flow generation rates for the various land uses found in Table 7.6 of this report were used to project the future wastewater flows for the service area.

The total district average and peak flows were calculated using the projected land use for 2030 flows. Estimated peak hour flows are not totaled as the peaking factor is dependent upon the average day flow rate. Summing the projected peak hour flow rates would produce a flow rate higher than the peak hour flow rate for the entire City. Therefore, the following 2030 peak hour flows were calculated by multiplying the total average flows by the MCES design factors. Table 7.8 presents the projected 2030 flows for each sanitary sewer district.

Note:

1. Projected 2030 peak hour flows equal the total average flow multiplied by MCES peaking factors.
2. The sum of the existing peak hour flow does not equal the sum of the peak discharges from each district since the peaking factor decreases as the average flow increases.
3. Peaking factors were taken from MCES factors.

Table 7.8 - 2030 Wastewater Flows per Sewer District

Sewer District	2010 Average Flow (MGD)	2010 Peak Hour Projected Flow (MGD)	2020 Average Flow (MGD)	2020 Peak Hour Projected Flow (MGD)	2030 Average Flow (MGD)	2030 Peak Hour Projected Flow (MGD)
B-Line	0.341	1.23	0.369	1.33	0.396	1.43
Central Int	0.278	1.03	0.287	1.06	0.296	1.10
Eagan Area	0.178	0.69	0.219	0.83	0.260	0.96
Junior College	0.522	1.77	0.528	1.80	0.535	1.82
North West	0.711	2.35	0.739	2.44	0.768	2.53
Old Village	0.093	0.37	0.097	0.39	0.100	0.40
South Grove	0.225	0.83	0.225	0.83	0.225	0.86
Alverno	0.028	0.11	0.12	0.47	0.213	0.81
Argenta	0.057	0.23	0.246	0.91	0.435	1.52
Robert	0.090	0.36	0.391	1.41	0.691	2.28
South Central	0.031	0.12	0.133	0.52	0.236	0.90
Total System	**2.554**	**6.90**	**3.35**	**8.71**	**4.155**	**10.39**

Intercommunity Flows

According to the Joint Powers Agreement between the Cities of Eagan and Inver Grove Heights, approximately 147 acres located at the border of Inver Grove Heights and Eagan will be routed into the existing sanitary sewer system in Eagan. The existing system in Eagan was designed to handle an additional flow of 0.4 MGD from Inver Grove Heights. The area to be served by Eagan is designated as the Eagan sewer District in Figure 7.1.

Proposed Sanitary Sewer Trunk System

Existing sanitary sewer asbuilts for pipe diameter and slopes were utilized to determine the ability of the existing trunk sanitary system to convey future wastewater flows. Future trunk mains and lift stations will be extended to accommodate future development, which in turn will increase the flows conveyed to the existing trunk system.

The MCES interceptor was not analyzed with the development of this report as MCES is responsible for monitoring flows and determining deficiencies for this main.

Table 7.9 shows information for the existing and proposed lift stations to service the 2030 service area. With the exception of the Pine Bend Lift

Station, all the existing lift stations have sufficient capacity to service the 2030 service area. The Pine Bend Lift Station is currently being upgraded to provide service to the South Central Sewer District Area.

Table 7.9: Lift Station Analysis

Lift Station	Existing or Proposed	Pumping Capacity (gpm)	Future Peak Hour Inflow (gpm)
River Road	Existing	50	50
Doffing Avenue	Existing	75	75
Forest Haven	Existing	75	75
70th Street	Existing	20	20
Whistletree Woods	Existing	50	50
Pine Bend	Existing	577	694
Argenta Hills	proposed	4300	4300
Arkansas Avenue	proposed	965	965
Hwy 55	proposed	1316	1316
Alverno Ave W	proposed	800	800

It should be noted that in addition to trunk lift stations, local lift stations may be necessary as development occurs and final grading plans are established. All local lift stations will be constructed and financed privately.

The trunk sewer system layout for the 2030 service area of Inver Grove Heights is presented on Figure 7.1. This map shows the sewer district boundaries, proposed trunk sanitary sewers, lift stations, and force mains. In addition, the approximate sizes of all future trunk facilities are shown. Figure 7.1 shows the existing and proposed trunk sewer system for the entire City. The proposed alignment of the trunk sanitary sewers as shown on the map is tentative and should be reviewed at the time of final design. The alignments shown on the map generally follow the natural drainage of the land to minimize the use of lift stations.

Proposed Sanitary Sewer Connection to Existing System

The majority of the wastewater generated in the 2030 Service Area will be conveyed to an existing trunk sanitary sewer at Babcock Trail. This existing trunk will then convey the flow to the MCES Central Interceptor along the northeastern border of the City. A small area will be conveyed to the City of Eagan. Areas of existing large lot developments, known as "exception neighborhoods (two in the Robert District and one in the Argenta District) will

Figure 7.2: Exception Neighborhoods

remain unsewered (see Figure 7.2), unless requested by residents or required due to failing on-site systems. Similarly, one area in the northern portion of the Robert District will remain unsewered unless requested or required.

The existing trunk currently conveys flow from a relatively small area of the city. In the future, it is proposed to convey flows from the MUSA Expansion Area as well as the industrial area in the southeastern portion of the City. This existing trunk was determined to have adequate capacity to convey the proposed flows.

Capital Improvements

Cost estimates have been prepared for the proposed trunk facilities outlined in this plan with the exception of the Northwest Area Trunk Utility Improvements Project and the Southern Sanitary Sewer Improvements which are currently under construction. The total estimated cost of all proposed facilities shown on Figure 7.1 is summarized in Table 7.10. Trunk sewers include force mains and all gravity lines greater than or equal to 12-inch in diameter.

Table 7.10: Cost Summary

Item	Estimated Costs
Trunk Sewers	$5,339,000
Lift Stations and Forcemains	$4,571,000
Total	$9,910,000

The estimated capital improvement costs as broken down by individual project is summarized in Table 7.11.

Table 7.11: Individual Project Cost Estimates

Project	Total Estimated Project Cost
North Roberts Trail Trunk Sewer Improvements	$2,193,000
Southern Argenta Trunk Sewer, Lift Station and Forcemain	$2,473,000
Alverno Trunk Sewer, Lift Station and Forcemain	$2,452,000
Northwest Argenta Trunk Sewer, Lift Station and Forcemain	$2,409,000
Miscellaneous Trunk Sewer Improvements	$383,000
Total	$9,910,000

The cost estimates include construction, design, legal, administration, and planning contingency costs. The estimated costs do not include costs for land acquisition. The planning contingency costs account for future unexpected costs. Examples include route changes by the developer or difficulties in construction such as unexpected bedrock or the requirement of excessive dewatering.

Cost estimates presented in this report are based on 2008 construction costs. Future changes in this index are expected to closely reflect cost changes in the proposed facilities. During the interim periods between full evaluation of projected costs, capital recovery procedures can be related to this index.

Easement acquisition and financing costs are not included in this estimate. It is anticipated that most of the easements required would be in public streets and open spaces, which will not be a cost to the City.

Funding

Utility usage fees are charged to both residential and non-residential users based on the actual water usage metered during the winter quarter. The purpose of the user charges is to fund the operation, maintenance, and replacement costs of existing collection systems. User charges are primarily based on the actual costs of operations, maintenance, and replacement of all wastewater system facilities.

City SAC fees provide a funding mechanism for construction of the major infrastructure improvements needed to serve growth. The City of Inver Grove Heights has established that growth should be funded and paid for by those who are in need of the facilities. The development creating the need for additional sanitary sewer system improvements are expected to finance new trunk facilities and expansion of existing facilities through City SAC fees. Currently, the SAC fees are calculated based upon the Metropolitan Council's SAC Procedure Manual, which assigns non-residential properties a SAC unit for office or industrial/commercial buildings.

Implementation

Goals and Policies

Growth of the trunk sanitary sewer system will be consistent with the Growth Management Policies outlined in the Comprehensive Plan (see Expansion of Urban Services on pages 2.34 and 2.35 of Chapter 2.).

The timing of future trunk sanitary sewer improvements will be influenced by several parameters including development in specific areas, failing on-site septic systems, regulatory requirements, availability of funds, etc. As a result it is difficult to accurately predict the time of future improvements especially those which may occur far into the future. Therefore, the Capital Improvement Program is intended to serve as a guide only for future fiscal planning and should be reviewed on a regular basis as more current planning and cost data becomes available.

The following items are general policy guidelines to be considered when reviewing and/or revising the City's sanitary sewer fee structure:

Sanitary Sewer Policies

1. The City will continue to maintain existing infrastructure systems to avoid or minimize inflow and infiltration issues.

2. The City will continue to plan for capacity to serve rural neighborhoods identified as "exception neighborhoods" however; these neighborhoods will not be required to hook up to sanitary sewer systems or incur costs until such time as services are requested by the neighborhood or a public health concern arises.

3. The City will not extend sanitary sewer to those areas guided for rural residential except in cases where public health is a concern.

4. The City will continue to implement a septic system maintenance and monitoring program consistent with Metropolitan Council guidelines.

5. The City will explore extension of infrastructure in a financially responsible manner and will seek to avoid circumstances where land owners are forced to develop due to the extension of infrastructure prior to their interest or readiness to develop.

6. The City will continue to invest in the maintenance and care of the existing sanitary sewer infrastructure in its efforts to control inflow and infiltration and to maximize the use of public financial resources.

Overdepth and Oversizing

The costs of additional depth shall be defined by differences in cost for the depth required by the development and the depth required for trunk facilities.

Trunk oversizing as defined by the City and installed by the developer will be credited using the differential of pipe costs between the larger and the minimum pipe size required for the development. Bid pricing shall not be the sole determinate in defining a developer credit. The City shall determine if a credit will be given for a project.

Lift Stations

Trunk lift stations will be defined as those included as part of the Comprehensive Sewer Plan. The cost of trunk lift stations will be financed by the City. Lift stations that do not fit the definition for a trunk lift station will be constructed and financed privately as needed to serve individual developments. All lift stations will be designed and constructed in accordance with City standards. The City encourages the use of gravity systems for conveyance of wastewater rather than costly and less efficient force mains and lift stations.

Existing Developed Unserviced Properties (Exception Neighborhoods)

There are a number of existing developed areas that do not receive sewer service within the City limits. These areas are referred to as exception neighborhoods (see pate 2.35 of Chapter 2 Land Use). The trunk system has been designed to accommodate all existing developed unserviced properties within the City, but it is not the policy of the City to force individual property owners to connect to City services. If an individual property owner or group of neighboring property owners wish to connect to City services where it is not yet available, the City will review whether or not it is an economically viable alternative to provide services to the area at the time of the request for connect. Existing developed unserviced residential properties will be required to pay all connection fees as required by the City Code.

Existing Non-Residential Unserviced Properties

Existing unserviced commercial/industrial or other non-residential properties wishing to expand or connect to municipal utilities shall be treated the same as new development and will be required to pay all connection fees as required by the City Code.

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Water Supply Plan

CHAPTER 8

Introduction

Salem Hills Watertower

PURPOSE

To accommodate the existing and projected growth, the City initiated an update to the 1998 Comprehensive Water System Plan in conjunction with the City's 2008 Comprehensive Plan and in accordance with Minnesota Statute 473.513.

The Department of Natural Resources (DNR) Division of Waters and the Metropolitan Council have worked together to develop a set of guidelines in which all cities are to complete their water system plans. The purpose of these guidelines is to provide the agencies with information regarding the water emergency and conservation procedures for that city. These guidelines are divided into four parts. The first three parts, Water Supply System Description and Evaluation, Emergency Response Procedures and Water Conservation Planning apply statewide. Part IV, relates to comprehensive plan requirements that apply only to communities in the Seven-County Twin Cities Metropolitan Area. The information contained in this report follows the DNR Water Supply Plan template directly.

The purpose of this study is to provide the City with an updated plan to serve future development, identify and correct existing system deficiencies, and estimate future water system costs. In addition, a number of conservation and emergency response procedures will be identified as part of this comprehensive plan.

Scope

The scope of this study incorporates the population projections from the 2008 Comprehensive Plan to project water system demands for the City of Inver Grove Heights through the year 2030. The potential 2030 service area was defined as the existing service area plus areas that can be feasibly served by the City's water supply system in the future based on the Land Use Plan prepared for the 2008 Comprehensive Plan. The 2030 service area generally includes the existing service area plus the northwest part of the community. Based on the 2030 service area, a trunk water main system, including storage and well supply capacities, was defined. Existing and future water demands were calculated for the City based on the historical data and population projections.

Future trunk improvements were defined with the intention that the trunk system would serve the 2030 service area. An approximate layout of potential 2030 trunk system improvements is provided. Future improvements were included in a Capital Improvement Program (CIP).

Data Available

In preparing this report, the following sources of information were utilized:

- City of Inver Grove Heights Draft 2008 Comprehensive Plan
- Water Supply Plan Template created by the Department of Natural Resources and the Metropolitan Council Environmental Services
- MCES System Statement for the City of Inver Grove Heights

General Contact Information

The City of Inver Grove Heights's water system has a DNR Water Appropriation Permit (1980-6052). The water system is managed by the Utility Superintendent at 8055 Barbara Avenue and all contact can be made at (651) 450-2565.

Water Supply System Description and Evaluation

The first step in any water supply analysis is to assess the current status of demand and supply and the existing water system infrastructure. Information in this section, including the water system capital improvement plan can be used in the development of Emergency Response Procedures and Conservation Plans in the subsequent sections.

Water Use Categories and Definitions

General water use categories and definitions as defined by the Department of Natural Resources are as follows:

- Residential uses consist of water being used for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens.

- Institutional uses consist of those for hospitals, day care centers, and other facilities that use water for essential domestic requirements. This includes public facilities and public metered uses. Institutional water use records are typically maintained for emergency planning and allocation purposes.

- Commercial uses consist of water used by hotels, restaurants, office buildings, and commercial facilities.

- Industrial uses consist of water used for thermoelectric power (electric utility generation) and other industrial uses such as steel, chemical and allied products, food processing, paper and allied products, mining, and petroleum refining.

- Wholesale deliveries consist of bulk water sales to other public water suppliers.

- Unaccounted water is the volume of water withdrawn from all sources minus the volume sold.

- Non essential water uses as defined by Minnesota Statutes 103G.291, include lawn sprinkling, vehicle washing, golf course and park irrigation, and other non essential uses. Some of the above categories also include non essential uses of water.

Residential Uses

Commercial Uses

Analysis of Existing Water Demand

Table 8.1 and Table 8.2 present the actual water demand for the past ten years. The City of Inver Grove Heights itemizes the water demand by customer category including residential, commercial, industrial, and institutional water sales.

Table 8.1: Historic Water Demand

Year	Total Population	Population Served	Total Services	Residential Water Sold (MG)	C/I/I Water Sold (MG)	Total Water Sold (MG)
1996	-	22,477	7614	609.30	127.34	736.64
1997	-	25,958	6019	405.00	300.49	705.49
1998	-	26,000	6403	641.7	186.0	827.7
1999	-	27,500	6678	724.0	168.6	892.6
2000	29,751	28,000	6874	772.4	163.2	935.6
2001	30,150	28,200	6763	804.87	168.63	973.50
2002	30,708	28,291	6728	782.99	168.22	951.21
2003	31,053	29,141	6898	913.3	211.5	1124.8
2004	32,193	29,910	7069	760.3	195.7	956.0
2005	33,195	29,500	7237	728.0	203.0	931.0
2006	33,139	29,500	7326	785.7	248.6	1034.3
2007	-	29,700	7356	803	270	1073
5 - year Avg				**798.06**	**225.76**	**1023.8**

MG – Million Gallons
MGD – Million Gallons per Day
C/I/I - Commercial, Industrial, Institutional

*Total population data per Minnesota State Demographic Center. Estimated population served per DNR Public Water Supply Inventories.

Table 8.2: Historic Water Demand

Year	Total Water Pumped	Percent Unmetered/ Unaccounted	Average Demand (MGD)	Maximum Demand (MGD)	Residential gallons/capita/ day	Total gallons/ capita/day
1996	-	-	2.01	-	74.27	89.79
1997	-	-	1.93	-	42.75	74.46
1998	-	-	2.27	-	67.62	87.22
1999	-	-	2.45	-	72.13	88.93
2000	972.7	3.81	2.56	-	75.58	91.55
2001	973.5	0	2.67	7.32	78.20	94.58
2002	961.3	1.05	2.61	5.1	75.83	92.12
2003	1116	0	3.08	7.2	85.86	105.75
2004	1052	9.13	2.62	6.5	69.64	87.57
2005	1038	10.314	2.55	7.6	67.61	86.46
2006	1134.9	8.86	2.83	8.2	72.97	96.06
2007	1152	6.86	2.94	6.53	74.07	98.98
5 - year Avg	**1098.58**	**6.81**	**2.81**	**7.21**	**74.03**	**94.96**

*Average demand based on gallons sold per day. Maximum day demand is based on gallons pumped in a day. It is not possible to measure the gallons sold on the highest water pumped day.

Factors that influence trends in water demand include growth, weather, industry, and conservation efforts. The population served by the City of Inver Grove Heights has increased. A result of this has released increased non-residential water demands. Therefore, total water demand, population served, and services have continually increased although residential and total water demand per capita has remained consistent.

Currently, the City of Inver Grove Heights has several large water users, however, none of the top ten water users individually utilize over 5% of the City's total water usage. Combined, the top ten water users attribute to approximately 12.8% of the City's total water usage. Table 8.3 that follows summarizes the City's top ten largest water utility users.

Table 8.3: Large Volume Users

Customer	Gallons per year	% of Total Annual Use
Emerald Hills village	46,503,000	4.33
Skyline Village	34,546,000	3.22
City of Inver Grove Heights	12,373,000	1.15
Condor Corp. (Salem Green Apts.)	11,480,000	1.07
Bridgewood	7,701,000	0.72
CHS Inc.	5,910,000	.055
Woodlyn Heights Health Care	5,097,000	0.48
Southview Gables Apartments #4970	4,546,000	0.43
Southview Gables Apartments #4890	4,500,000	0.42
Blackberry Point Apartments	4,444,000	0.41

Existing Treatment, Storage, and Distribution Facilities

The City of Inver Grove Heights currently treats all water at the City's municipal water treatment facility. The municipal water treatment facility has an existing capacity of 12 Million Gallons per Day (MGD). The plant process involves iron and manganese removal, fluoridation, and chlorination. The facility includes 8 gravity sand filters, 5 backwash settling tanks, 6 high service pumps, a one million gallon clearwell, various chemical feed rooms, a control room and two laboratories.

There are five storage facilities described in Table 8.4 with a usable storage volume of 11.5 million gallons serving the City of Inver Grove Heights's water

system. As detailed in Table 8.2, the City's average day demand is 2.81 million gallons on average for the past 5 years. Ten State Standards recommend providing storage capacity equal to the City's current average day demand, therefore, the City's system provides adequate water storage.

Table 8.4: Storage Facilities

Facility	High Water Level	Reservoir Type	Storage Volume (MG)	Useable Storage Volume (MG)	Service Area	Year Constructed
South Grove Reservoir	1014	Ground	5.0	3.5	South Grove	1989
Asher	1115	Standpipe	2.5	0.8	Asher	1972
North	1160	Elevated	1.0	0.75	North	1988
Clearwell	977	Ground	1.0	0.75	South Grove	1998
Arbor Pointe	1115	Elevated	2.0	1.5	Asher	2005

Because the City's topography ranges considerably, the system operates under four pressure zones. The Reduced Pressure Service Area is served by pressure reducing valves from the South Grove Service Area. The Babcock Booster Station pumps water from the South Grove Service Area to the Asher Service Area. The North Booster Station pumps water from the Asher Service Area to the North Service Area. The high water level for each pressure zone is as follows:

Reduced Pressure Service Area	911
North Service Area	1160
Asher Service Area	1115
South Grove Service Area	1014

The existing water system is shown in Figure 8.1. The future water system is shown in Figure 8.3 and was developed based on the northwest area water system improvements included in the May 2005 Northwest Area Feasibility Report. The City of Eagan provides water service to a portion of Inver Grove Heights south of Highway 55. Existing connections to Eagan are primarily the mobile home park and some residential development in the vicinity of Cliff Road. There is a small overlap in the Eagan and Inver Grove Heights service areas. While Eagan or Inver Grove Heights could serve the area south of Highway 55 and north of the mobile home park with water, it is not the City of Inver Grove Heights practice to use the City of Eagan for water service.

Existing Water Sources

The City of Inver Grove Heights currently has six wells in service. They are designated Well No. 3, Well No. 4, Well No. 5, Well No. 6, Well No. 7, and Well No. 8. All wells except Well No. 6 draw water from the Jordan Formation. Well No. 6 draws water from the Mt. Simon – Hinckley Aquifer. Groundwater from the wells is treated at the water treatment facility as described in the previous section. Following treatment, water is pumped into the distribution system.

The rated capacity of the existing wells is 7,000 gallons per minute (gpm). However, Ten State Standards recommends maximum day demand be satisfied with the largest pump out of service (firm capacity). The firm capacity for the City's existing water system is 5,800 gpm.

In the past five years, the maximum day demand for the City's water system was on average approximately 7.4 million gallons per day (gpd) which equates to 5,200 gpm. Supply firm capacity is sufficient to supply maximum day water system demands. The City is currently constructing Well No. 9 to add further capacity to the system, which should be in service by 2009.

Table 8.5 summarizes the City's current groundwater sources. Copies of water well records and well maintenance information are included in the Water Supply Plan submitted to the MN DNR.

Ten State Standards

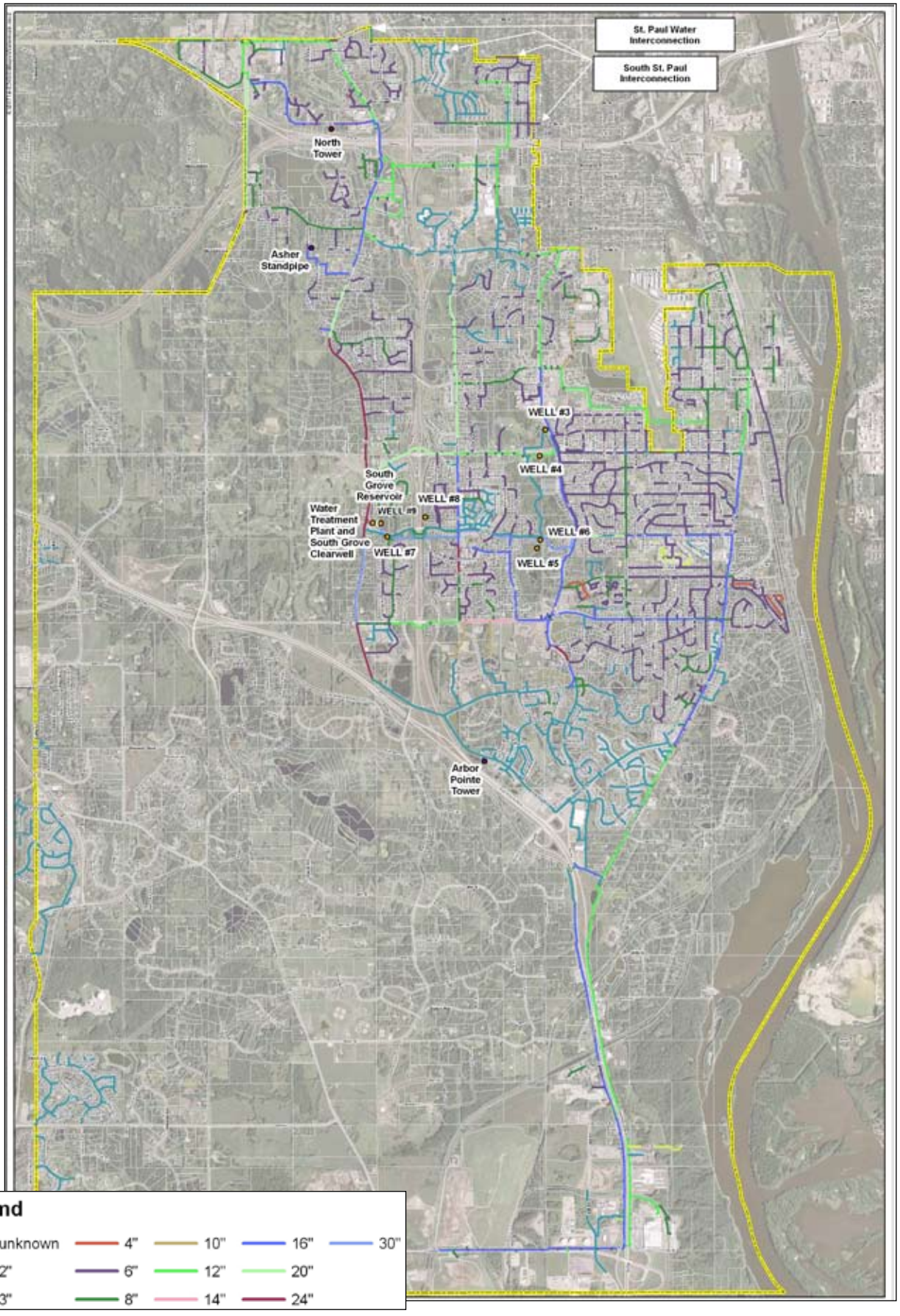
The ten state standards are the recommended standards for Water Works and include policies for the review and approval of plans and specifications for public water supplies . The standards are in a report of the Water Supply Committee of the Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers and can be found at www.10statestandards.com.

MEMBER STATES AND PROVINCE
Illinois Indiana Iowa Michigan Minnesota Missouri New York Ohio Ontario Pennsylvania Wisconsin

Table 8.5: Ground Water Well Summary Information

Well No.	Unique Well Number	Year Installed	Well & Casing Depth (ft)	Well Diameter (in)	Capacity (GPM)	Geological Unit	Status
1	225846	1956	430	12	-	Oneota - Jordon	Sealed
2	208370	1960	441	12	-	Jordan	Sealed
3	207284	1970	407	24	1200	Jordan	Active Use
4	207285	1970	360	24	1200	Jordan	Active Use
5	165640	1980	452	16	1200	Jordan	Active Use
6	433259	1987	1044	18	1000	Mt. Simon - Hinckley	Active Use
7	463527	1990	514	18	1200	Jordan	Active Use
8	655940	2004	242	18	1200	Jordan	Active Use
9	TBD	2008	TBD	TBD	TBD	Jordan	Under Construction

Figure 8.1: Existing Water System



Emergency Interconnections

The City of Inver Grove Heights has three interconnections with the City of South Saint Paul and one with West St. Paul which are only used in the event of an emergency. The City of West Saint Paul is supplied water by Saint Paul Regional Water Services which has a supply capacity of approximately 144 MGD.

Demand Projections

The following table, Table 8.6, summarizes the City of Inver Grove Heights's projected population served by the water system for the next ten years, the average day demand, the maximum day demand, and the projected demand per year. It should be noted however that the average and maximum projected water demand is not water pumped and does not include unaccounted for water.

Table 8.6: Ten Year Demand Projections

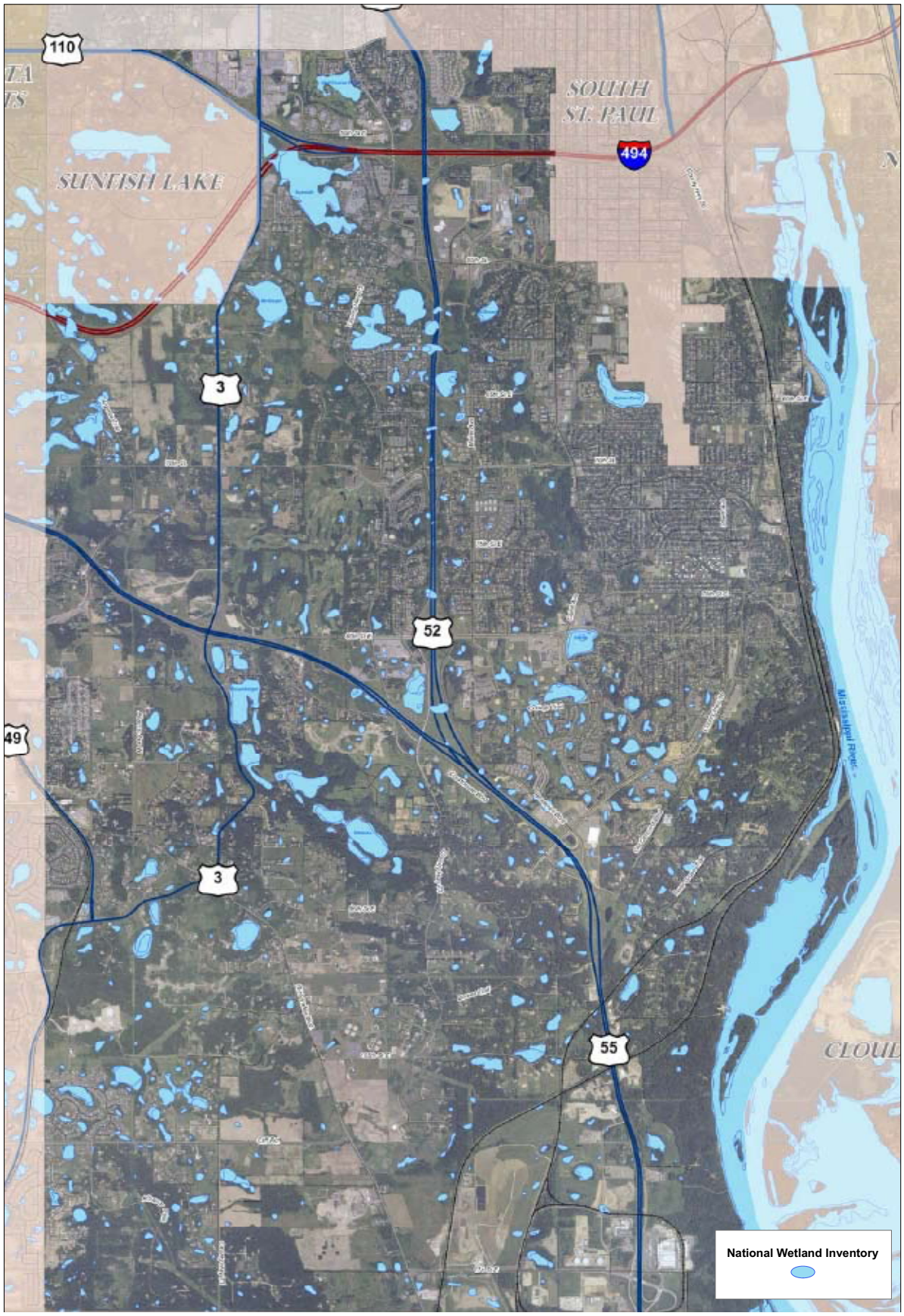
Year	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)
2008	30,314	2.88	6.49	1,051
2009	30,427	2.94	7.64	1,073
2010	31,541	2.99	7.79	1,091
2011	32,251	3.06	7.96	1,117
2012	32,960	3.13	8.14	1,142
2013	33,670	3.20	8.32	1,168
2014	34,379	3.27	8.50	1,194
2015	35,089	3.33	8.66	1,241
2016	35,798	3.40	8.84	1,241
2017	36,508	3.47	9.02	1,267
2018	37,217	3.54	9.20	1,292

MGD – Million Gallons per Day
MGY – Million Gallons per Year

Projections made are per the 2030 Comprehensive Plan Update and the following assumptions:

- Existing unserved population has averaged approximately 2,500 people between 2000 and 2006. Population served was projected by reducing the projected total population by 2,500.
- Total population served was then linearly projected between 2006 and 2010 and also between 2010 and 2020, based on projections included

Figure 8.2: National Wetland Inventory (NWI)



in the Comprehensive Plan.

- Average day demands were calculated using the average water demand per capita per day (GPCD) for the past 5 years. A demand of 95 GPCD was assumed for 2008 through 2018.
- The average peaking factor for average day demand to maximum day demand for the past five years is 2.6. This peaking factor was applied to the average day demands for the projected maximum day results.

Table 8.7 summarizes the population projections in ten year increments consistent with those in the City's 2008 Comprehensive Plan update.

Table 8.7: 2030 Demand Projections

Year	Total Community Population	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)
2010	33,910	31,541	2.99	7.79	1,091
2020	40,540	38,637	3.67	9.54	1,314
2030	47,250	45,674	4.34	11.28	1,584

Resource Sustainability

Sustainable water to provide for the needs of society, now and in the future, without unacceptable social, economic, or environmental consequences. The City of Inver Grove Heights has kept well monitoring records in accordance with the resource sustainability requirements of the Department of Natural Resources. Records of water levels are maintained for the existing six production wells that are in service. Water level readings are taken periodically for the production wells which are representative of the water levels in each water source formation. Well number 9, once completed, will also be monitored in this manner.

Sustainable Water Use

Sustainable water use is defined as the use of water to provide for the needs of society, now and in the future, without unacceptable social, economic, or environmental consequences.

The water levels of each well within the City of Inver Grove Heights have maintained a constant level given the monitoring information provided from the construction of each well, maintenance records, and pumping level information. These records are included in the Water Supply Plan submitted to the MN DNR. Data indicates the aquifer as a sustaining water supply. Table 8.8, summarizes the monitoring procedures. Also included in the Water Supply Plan submitted to the MN DNR is water level information from a local DNR observation well which shows a gradually increasing water level.

Figure 8.3: Future Water System

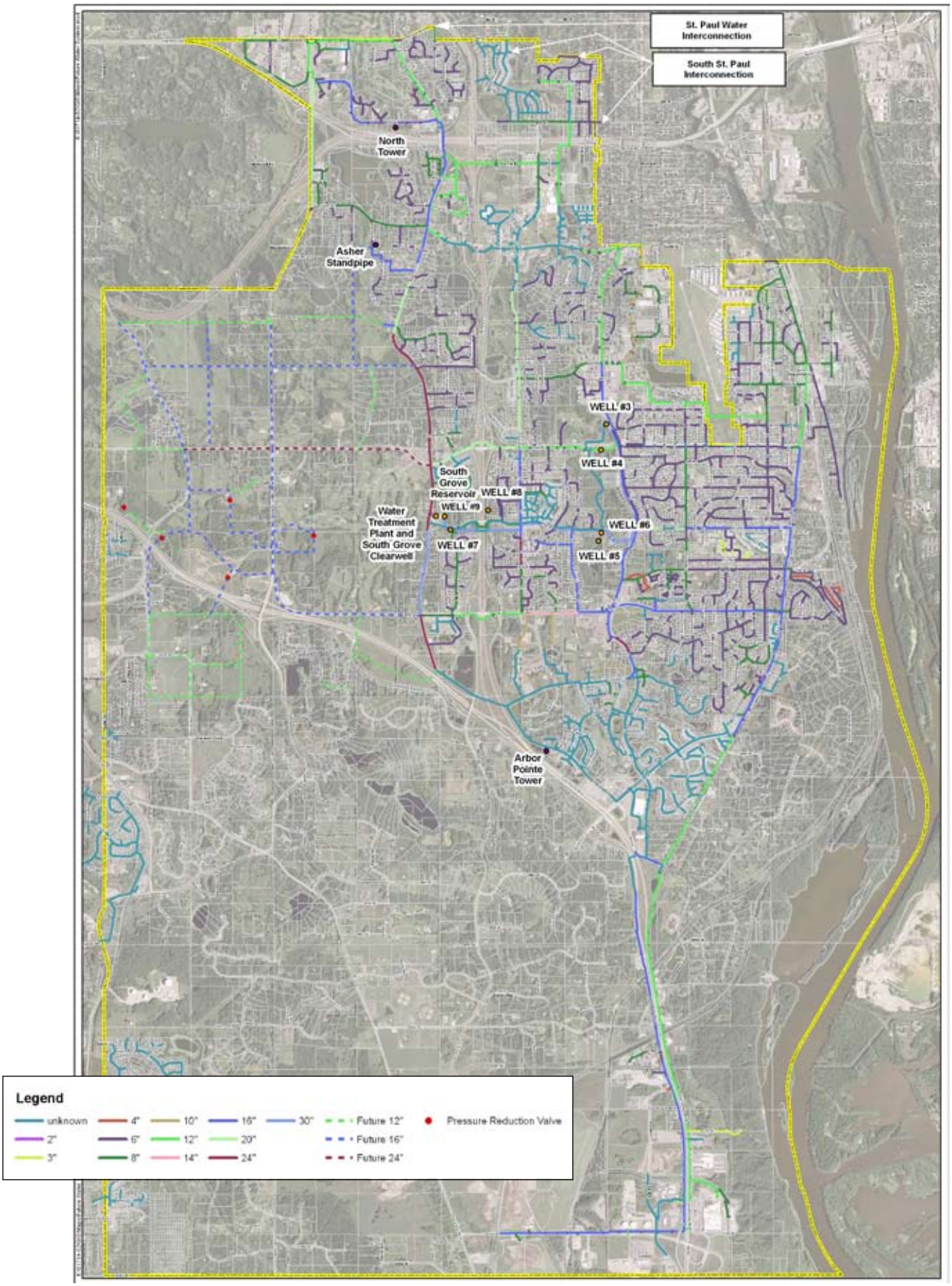


Table 8.8: Monitoring Wells

Unique Well Number	Type of well (production, observation)	Frequency of Measurement (daily, monthly, etc.)	Method Measurement (steel tape, SCADA etc.)
207284	Production	On-Going	SCADA
207285	Production	On-Going	SCADA
165640	Production	On-Going	SCADA
433259	Production	On-Going	SCADA
463527	Production	On-Going	SCADA
655940	Production	On-Going	SCADA
19005	DNR Monitoring	Periodically	

Currently, there are no natural resource features in the City of Inver Grove Heights that could be affected by municipal production well withdrawals. Figure 8.2 presents the National Wetland Inventory (NWI) for the City. There are protected and impaired surface waters within the City; the hydrogeology of the Prairie du Chien – Jordan Aquifer indicates that the Jordan portion of the aquifer is confined within Inver Grove Heights except at the far eastern edge near the Mississippi River (per Minnesota Geological Survey) and the southernmost part of Inver Grove Heights. Therefore, groundwater may influence surface waters. However, a thick layer of glacial sediment covers the bedrock in all parts of Inver Grove Heights except near the river to the east. This inhibits vertical water transmission and makes the Jordan less susceptible to contamination.

Historically, the Jordan Aquifer has maintained a constant static water level and, therefore, indicates there is ample water supply for the foreseeable future to meet projected demands.

Mt. Simon – Hinckley Aquifer is confined beneath Inver Grove Heights. The hydrogeology of the Mt. Simon – Hinckley Aquifer water does not influence surface waters and surface waters do not influence the water in this aquifer. Resource protection thresholds have not been established, as the groundwater and surficial natural resource features have been determined to not influence each other.

Historically, the Mt. Simon – Hinckley Aquifer has a declining water level, so regulatory protections have been established to ensure there is ample water supply for the foreseeable future to meet projected demands.

Preventative Maintenance

Inver Grove Heights has been granted an extension by MDH to complete the Wellhead Protection Plan. The City does not have any surface water supplies. Long term preventative programs and measures for the City's existing water system will help reduce the risk of emergency situations. The City of Inver Grove Heights staff performs much routine maintenance to ensure proper performance of treatment plant equipment, well pumps, and distribution system.

Future Water System Improvements

Maintenance at the Water Treatment Facility consists of maintaining several systems including the chemical feed systems, backwash reclaim system, high service pumps, and filter media.

Chemical feed system maintenance includes annual servicing of chlorine feed and storage equipment. Chlorine feeds lines are replaced annually. Potassium permanganate, fluoride, and manganese sulfate feed systems are annually serviced and equipment replaced as necessary.

Backwash reclaim system maintenance consists of semiannual reclaim tank inspection and cleaning, semiannual pumping equipment inspection and lubricant changing, and annual air scrubbing and backwash pumping equipment servicing.

High service pump maintenance consists of semi-annual electric pump motor servicing and vertical turbine pump servicing after 30,000 hours of use.

The depth and condition of the filter media is checked annually.

Well pumps are serviced after approximately 1 billion gallons are pumped. Hollow shaft well pump motors are serviced semi-annually and submersible well pump motors are serviced after approximately 1 billion gallons are pumped.

Distribution system maintenance includes flushing/exercising of all hydrants in the spring. Dead end mains are flushed in the fall in addition to the spring flushing.

The City of Inver Grove Heights's water capital improvements plan includes

improvements to expand system supply as growth occurs, as well as water main extensions necessary to serve the northwest area. A summary of the City's capital improvements plan is included in the following sections.

Inver Grove Heights Water Tower

Emergency Response Procedures

Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failures, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all hazard emergency operations plan.

Federal Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV – Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan. As the City of Inver Grove Heights does serve over 3,300 people, the City is required to complete the Federal Emergency Response Plan. The Federal Emergency Response was certified in October of 2005. The emergency response lead is the Chief of Police, and the alternative emergency response lead is assigned to a Police Lieutenant.

Allocation and Demand Reduction Procedures

Water Supply Plans as required by the Department of Natural Resources and the Metropolitan Council must include procedures to address gradual decreases in water supply as well as emergencies and the sudden loss of water due to line breaks, power failures, sabotage, etc. During periods of limited water supplies public water suppliers are required to allocate water based on the priorities established in Minnesota Statutes 103G.261.

These allocation and demand reduction procedures must also be in accordance with the Minnesota State Statutes 103G.261, which identifies and defines the priorities in which water usage will be allocated in the event of an emergency. These priorities are defined as follows:

- The first priority water use category includes domestic water supply only and excludes industrial and commercial uses of municipal water supply. The first priority also includes uses for power production that meets contingency requirements. Domestic use is defined by MN Rules 6115.0630, Subp. 9, as use for general household purposes for human needs such as cooking, cleaning, drinking, washing, and waste disposal, and uses for on farm livestock watering excluding commercial livestock operations which use more than 10,000 gallons per day or one million gallons per year.
- The second priority water use category includes uses involving consumption of less than 10,000 gallons per day.
- The third priority water use category includes uses for agricultural irrigation and processing of agricultural products.
- The fourth priority water use category includes uses for power production in excess of the use provided for in the contingency plan under first priority.
- The fifth priority water use category includes uses, other than agricultural irrigation, processing of agricultural products, and power production.
- The sixth priority water use category includes non essential uses. These uses are defined by Minnesota Statutes 103G.291 as lawn sprinkling, vehicle washing, golf course and park irrigation, and other non essential uses.

Table 8.9 presents the statutory water use priorities along with any local priorities for the City of Inver Grove Heights. Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Local allocation priorities will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. Table 8.9 lists the priority ranking, average day demand, and demand reduction potential for each customer category in the City.

Table 8.9: Water Use Priorities

Customer Category	Allocation Priority	Average Day Demand (GPD)*	Demand Reduction Potential (GPD)**
Residential	1	2,200,00	1,635,210
Institutional	1	84,900	35,860
Commercial	2	619,200	60,270
Industrial	3	35,600	6,470
Irrigation	4	0	0
Wholesale	5	0	0
Non-essential	6	0	0
	TOTALS	2,939,700	1,738,080

**Calculated using 2007 Water Demand*

***The demand reduction potential for residential use will typically be the base demand during the winter months when water use for non-essential uses such as lawn watering does not occur. The difference between summer and winter demands typically defines the demand reduction that can be achieved by eliminating non-essential uses. In extreme emergency situations lower priority water uses must be restricted or eliminated to protect first priority domestic water requirements. Short-term demand reduction potential should be based on average day demands for customer categories within each priority class.*

Triggers for Allocation and Demand Reduction

Triggers for allocation and demand reduction actions are defined by the City of Inver Grove Heights for implementing emergency responses, including supply augmentation, demand reduction, and water allocation. Examples of triggers can include the water demand in excess of 100% of storage capacity, the water level in the City's wells below a certain elevation, etc. Each trigger should have a quantifiable indicator and actions can have multiple stages such as mild, moderate, and severe responses. The following are triggers that the City of Inver Grove Heights has identified and are used for implementing emergency responses:

- Demand greater than 97% of well firm capacity
- Demand greater than 99% of well firm capacity
- Demand greater than 100% of well firm capacity Governor's Executive Order – Critical Water Deficiency (required by Statute)

Table 8.10 presents quantitative triggers for implementing water emergency procedures and the actions to be taken. System failures are not included in

the outlined triggers. Triggers may be adjusted if equipment failures occur. In addition, the potential for water availability problems during the onset of a drought are almost impossible to predict. Significant increases in demand should be balanced with preventative measures to conserve supplies in the event of prolonged drought conditions.

Table 8.10: Demand Reduction Procedures

Response Level	Trigger (s)	Demand Reduction Procedures
Stage 1	Demand > 7.93 MGD = 5,510 GPM = 95% well firm capacity	Odd/even lawn watering ban.
Stage 2	Demand > 8.10 MGD = 5,626 GPM = 99% well firm capacity	Total sprinkling ban.
Stage 3	Demand > 8.27 MGD = 5,742 GPM and towers below fire/ reserve level	Eliminate 3rd priority allocation.
Stage 4	Demand > 8.35 MGD = 5,800 GPM = 100% well firm capacity	Eliminate 2nd priority allocation.
Critical Water Deficiency (M.S. 103G.291)	Executive Order by Governor as provided in above triggers	Stage 1: Restrict lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses. Stage 2: Suspend lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses.

Notification procedures as designated by the City of Inver Grove Heights include methods that will be used to inform customers regarding conservation requests, water use restrictions, and suspensions. Customers should be aware of emergency procedures and responses that the City may need to implement.

Methods used to inform customers of water use restrictions include:

- Billing Fliers
- Local Radio
- Local Television
- Local Newspaper

Enforcement

Minnesota Statutes require public water supply authorities to adopt and enforce water conservation restrictions during periods of critical water shortages. As stated in Minnesota Statutes 103G.291, Subdivision 1, regarding public water supply appropriation during deficiency, if the governor determines and declares by executive order that there is a critical water deficiency, public water supply authorities appropriating water must adopt and enforce water conservation restrictions within their jurisdiction that are consistent with rules adopted by the commissioner. The restrictions must limit lawn sprinkling, vehicle washing, golf course and park irrigation, and other nonessential uses, and have appropriate penalties for failure to comply with the restrictions.

The copy of the draft ordinance is included in the Water Supply Plan submitted to the MN DNR. The City's existing watering restriction is voluntary. There is no enforcement of the existing watering restriction. However, utilities staff have noted significant decreases in water consumption when the restrictions are initiated.

Water Conservation Plan

Water conservation programs are intended to reduce demand for water, improve the efficiency in use and reduce losses and waste of water. Long term conservation measures that improve overall water use efficiencies can help reduce the need for short-term conservation measures. Water conservation is an important part of water resource management and can also help utility managers satisfy the ever increasing demands being placed on water resources.

Minnesota Statutes 103G.291, requires public water suppliers to implement demand reduction measures before seeking approvals to construct new wells or increases in authorized volumes of water. Minnesota Rules 6115.0770, require water users to employ the best available means and practices to promote the efficient use of water. Conservation programs can be cost effective when compared to the generally higher costs of developing new sources of supply or expanding water and/or wastewater treatment plant capacities.

Conservation Goals

Conservation Goals

The following section establishes goals for various measures of water demand. The programs necessary to achieve the goals will be described in the following section.

The American Water Works Association (AWWA) recommends that unaccounted for water not exceed 10% of the City's total average annual volume of water consumed. In the last five years, the City of Inver Grove Heights's unaccounted for water totals an average of 74.7 million gallons which is approximately 7% of the City's average annual volume of water consumed. The amount of unaccounted water should be monitored regularly as it is a good indication of pipe breaks or system failures.

In 2002, average residential gallons per capita per day (GPCD) use in the Twin Cities Metropolitan Area was 75. In the last five years, the City of Inver Grove Heights's residential gallons per capita demand averaged 74.03 GPCD which is approximately 1 GPCD under the Twin Cities average. Totals per capita demand has also remained consistent over the past 10 years, fluctuating only during periods of hot, dry weather. Total per capita demand has averaged approximately 95 GPCD for the last five years. In the last five years, the City of Inver Grove Heights's average maximum day to average day ratio was 2.6. The Department of Natural Resources recommends a maximum day to average day demand ratio of 2.6.

Water Conservation Programs

The City of Inver Grove Heights has short term conservation measures available for use in an emergency. Short term demand reduction measures are included in the emergency response procedures and must be in support of, and part of, a community all hazard emergency operation plan.

1. Metering: The American Water Works Association (AWWA) recommends that every water utility system meter all water taken into its system and all water distributed from its system at its customer's point of service. An effective metering program relies upon periodic performance testing, repair, and maintenance of all meters. AWWA also recommends that utilities conduct regular water audits to ensure accountability. Table 8.12 below presents a summary of the number of meters and their maintenance schedule including source water meters. Currently there are no known unmetered connections to the City of Inver Grove Heights's water system.

Table 8.12: Water Meters

	Number of Metered Connections	Meter Testing Schedule (years)	Average Age/Meter Replacement Schedule
Residential	7,054	Not tested	Replaced after 2 million gallons of consumptions
Institutional	32	Tested or replaced on schedule according to individual meter size	
Commercial	263		
Industrial	7		
Water Source (wells)	6	5	As necessary per testing
Treatment Plant	1		

2. Unaccounted Water: Water audits are intended to identify, quantify, and verify water and revenue losses. It is recommended by the AWWA that the volume of unaccounted for water should be evaluated each billing cycle. The City of Inver Grove Heights currently evaluates the unaccounted for on an annual basis. Annually leak detection surveys are performed to identify and repair water loss locations.
3. Conservation Water Rates: The City currently has implemented an increasing block rate structure. It includes a base charge for a minimum number of gallons and increases in three steps as the volume consumed increases. Water rates are evaluated annually. Customers are billed monthly or quarterly dependent on the type of customer. The City's current rates are as follows:

<u>Single Family Dwelling</u>

The first 6,000 gallons or less	$18.30 per quarter
6,001-20,000 gallons	$2.12 per 1,000
20,001-40,000 gallons	$2.34 per 1,000
40,001 and more gallons	$2.64 per 1,000

The minimum charge per quarter shall be $18.30

<u>Multi-Family/Mobile Homes</u>

The first 2,000 gallons or less	$6.10 per unit/per month
2,001-7,000 gallons	$2.12 per 1,000
7,001-13,000 gallons	$2.45 per 1,000
13,001 and more gallons	$2.64 per 1,000

The minimum charge per unit per month shall be $6.10

Commercial/Institutional/Industrial

The first 2,00 gallons or less	$6.10 per unit/per month
2,001-7,000 gallons	$2.12 per 1,000
7,001-13,000 gallons	$2.45 per 1,000
13,001 and more gallons	$2.64 per 1,000

The minimum charge per month shall be $6.10

Special Senior Rates

0-6,000 gallons per quarter	$9.15 per quarter
6,001 and more gallons	Same as applicable rate above

4. Regulation: The City of Inver Grove Heights also has a number of regulations for short term reductions in demand and long term improvements in water efficiencies. The City has adopted a voluntary odd/even watering policy to help reduce peak demand and to reduce demand in emergency situations. The City also enforces all mandated State and Federal Regulations. These regulations include the Minnesota Statute 103G.298 requiring all automatically operated landscape irrigation systems to have furnished and installed technology that inhibits or interrupts operation of the landscape irrigation system during periods of sufficient moisture. The technology must also be adjustable either by the end user or the professional practitioner of landscape irrigation services. The 1992 Federal Energy Policy Act established manufacturing standards for water efficient plumbing fixtures, including toilets, urinals, faucets, and aerators and is also enforced with the City's building permit and inspections department.
5. Education and Information Programs: The City of Inver Grove Heights provides information on how to improve water use efficiencies by a number of education methods throughout the year. The City publishes water conservation information and tips in the annual water quality report and the bimonthly Insights City Newsletter. Also, the City has been coordinating with middle schools to become a part of the "wet" program, and bring schools to the water treatment facility for tours. Table 8.13 below summarizes the City's educational efforts.

Table 8.13: Current Education Programs

Current Education Programs	Frequency/ Year
Consumer Confidence Reports	1
Insights City Newsletter	6
Information at Public Buildings	On-Going
Water Facility Tours	On-Going
Wet Program	Future program

Capital Improvement Program

General

A capital improvement program for the Inver Grove Height's water supply, distribution and storage system is presented in Table 8.14. The table shows the supply, distribution and storage facilities to be added and the estimated costs for each year. The cost estimates in this report are based on 2007 construction costs. Cost estimates include 10% for contingencies and 25% indirect costs.

Distribution improvements for the Northwest Area have been included in the CIP in accordance with the May 2005 Northwest Area Feasibility Report. Due to the uncertainty of exact development patterns at this time, Northwest Area Improvements have been included in the 2007 to 2010 time frame.

Based on the projected future water demand (as derived from population, household and employment projections), it is likely that supply will need to be increased to supply future development. One or two additional wells will be required for firm capacity to meet the projected 2030 maximum day demands. However, water usage should be monitored and projections updated periodically to confirm that the appropriate improvements are planned in order to meet Ten-State Standards recommendations. These recommendation include being able to supply the projected maximum day demand with the largest well out of service.

Table 8.14: Capital Improvement Programs

Year	Improvement	Total Cost
2007-2010	Northwest Area Water Extensions (Distribution System Improvements and Easements)	$4,115,400
2010-2020	Well and Well House	$1,375,000
2020-2030	Well and Well House	$1,375,000
Total		**$6,865,400**

Funding

The City's water fee structure includes water user fees, trunk water fees, and water availability charge fees (WAC). The water fees are collected to cover the operation, maintenance and replacement costs of the existing systems and provide a funding mechanism for construction of the major infrastructure improvements needed to serve growth. The City of Inver Grove Heights has

established that growth should be funded and paid for by those who are in need of the facilities. The parties creating the need for additional water system improvements are expected to pay for new trunk facilities and expansion of existing facilities through trunk and WAC fees.

User charges (Water Rates) are used to fund operations, maintenance, and replacement costs of wells, water treatment facilities, water storage facilities, booster pumps, and the distribution system.

Trunk water fees are used to fund new wells, pump houses, raw water transmission mains, water storage facilities, and booster pump stations. Trunk water fees are also used to fund oversizing of watermains more than what is needed for a general development, considered watermains, which exceed 8 inches in diameter for residential development and which exceed 12 inches for commercial/industrial development.

The water availability charge is used to fund water treatment facility improvements.

Implementation

Summary of Water Supply Plan Policies

It is the policy of Inver Grove Heights to:

1. Provide water to the community that meets the standards required by the State of Minnesota.
2. Minimize the amount of unaccounted water usage to maintain a level of lower than 10% of the City's total average annual volume of water consumed.
3. Ensure adequate water pressure to meet daily usage needs and provide adequate pressure for emergency services.
4. Continue to monitor and maintain storage consistent with Ten State Standards.
5. Continue with practices to maintain the existing water supply and distribution system.
6. Maintain or improve upon the average maximum day to average day demand ratio of 2.6.

Critical Area Plan

CHAPTER 9

Overview

The Mississippi River has played a significant role in the development of the Twin Cities Metropolitan Area. Serving many purposes including recreation, transportation, a source of energy, a source for drinking water, a tourist attraction, and a boundary, the Mississippi River is a resource not to be taken for granted. Recognizing the dependence the region has on the river, an executive order was signed in 1976 declaring the river corridor a Critical Area. The order also established guidelines and regulations for developing critical area plans that address the intentions of Executive Order 79-19. These plans were created by local units of government and reviewed by regional government agencies to ensure consistency with state laws. This order stated the following purposes for designating this part of the river as a critical area:

1. To protect and preserve a unique and valuable state and regional resource for the benefit of the health, safety and welfare of the citizens for the state, region and nation:
2. To prevent and mitigate irreversible damage to this state, regional and national resource;
3. To preserve and enhance its natural, aesthetic, cultural, and historical value for the public use;
4. To protect and preserve the river as an essential element in the national, state and regional transportation, sewer and water and recreational systems; and
5. To protect and preserve the biological and ecological functions of the corridor.

The Critical Area includes 72 miles of Mississippi River stretching from the cities of Dayton and Ramsey to just south of Hastings. The segment of the

Critical Area Act

The "Critical Areas Act" was enacted in 1973 by the Minnesota State Legislature. The Act prescribed a process for planning and managing areas of regional and state-wide interests, areas of significance that transcend local government's authority.

Mississippi flowing through the Minneapolis/St. Paul metropolitan area has always been of major significance as a resource, a boundary, a transportation corridor, a source of sustenance and energy, a place for recreation, an artistic inspiration, and a tourist attraction. It has been a home and a work place, a source of water, and sometime sewer. Demands upon it have frequently challenged state agencies, local governments, organizations, and area citizens.

The Critical Area Corridor map shows the boundary within Inver Grove Heights (see Figure 9.1). It can generally be described as the east 1,000 feet of the community bordering the river and including portion of the Mississippi River. The Critical Area Corridor in Inver Grove Heights is comprised of three districts: 1) Rural Open Space District, 2) Urban Diversified District, and 3) Urban Developed District (see Sidebar).

National Park System

On November 18, 1988, Public Law 100-696 established the Mississippi National River and Recreation Area (MNRRA) as a unit of the national park system

Critical Area Guidelines

In order to manage the river corridor consistent with its natural characteristics and its existing development, the following guidelines are established for each corridor district:

Rural Open Space District - The lands and waters within this district shall be used and developed to preserve their open, scenic and natural characteristics and ecological and economic functions. Presently undeveloped islands shall be maintained in their existing natural state. The transportation function of the river shall be maintained and preserved.

Urban Diversified District - The lands and waters within this district shall be used and developed to maintain the present diversity of commercial, industrial, residential, and public uses of the lands, including the existing transportation use of the river; to protect historical sites and areas, natural scenic and environmental resources; and to expand public access to and enjoyment of the river. New commercial, industrial, residential, and other uses may be permitted if they are compatible with these goals.

Urban Developed District - The lands and waters within this district shall be maintained largely as residential areas. The expansion of existing and development of new industrial, commercial, and other non-residential or nonrecreational uses shall be limited to preserve and enhance the residential character of this district.

Source: Minnesota Department of Natural Resources

Critical Area / MNRRA Relationship

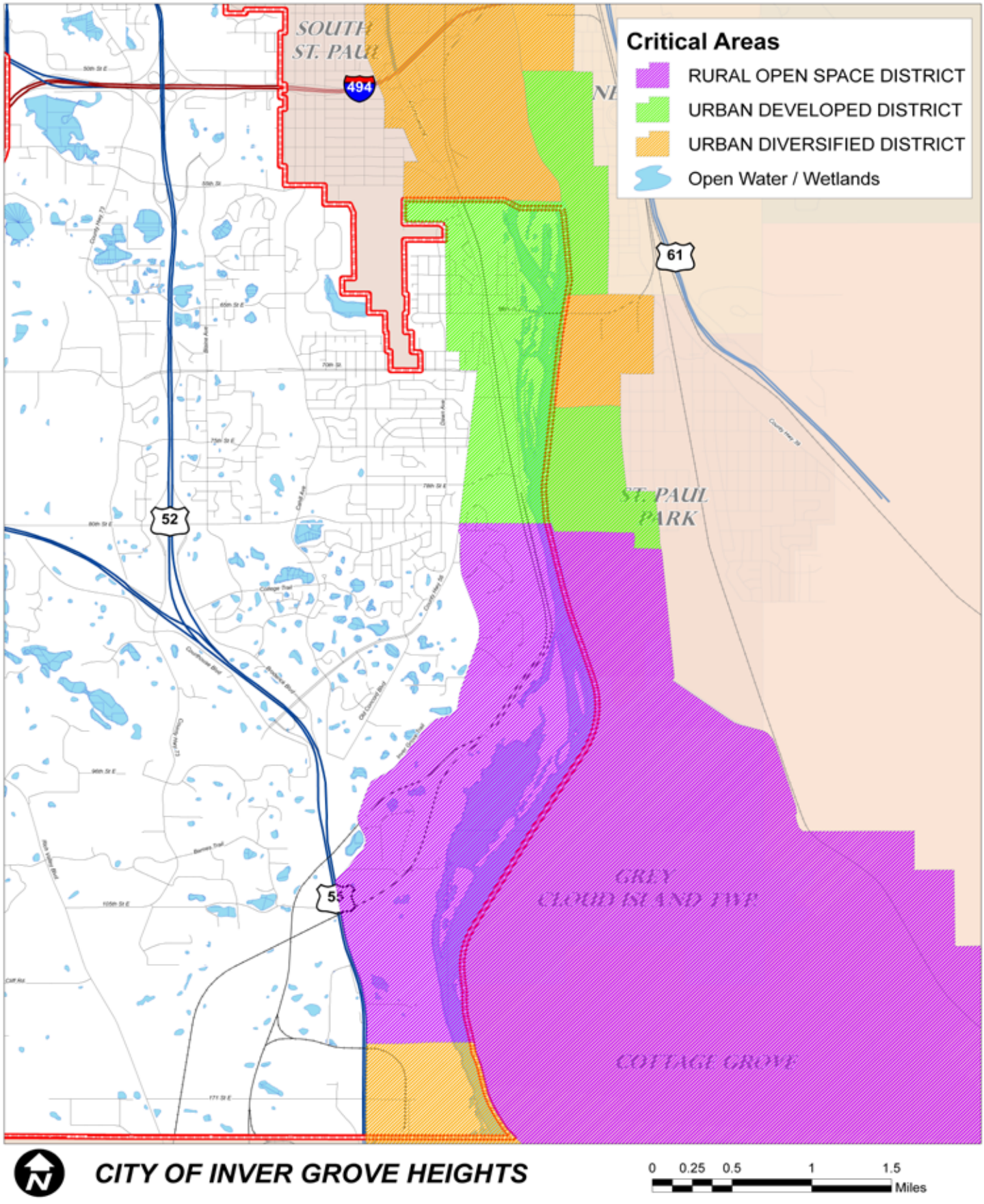
In addition to the Critical Area designation, the corridor has also been established as a unit of the national park system. The system is composed of about 370 areas nationwide administered by the National Park Service (NPS), an agency of the U.S. Department of the Interior. The Mississippi National River and Recreation Area was established by Congress to:

1. Protect, preserve, and enhance the significant values of the Mississippi River corridor through the Twin Cities metropolitan area.
2. Encourage coordination of federal, state, and local programs.
3. Provide a management framework to assist the state of Minnesota and units of local government in the development of and implementation of integrated resource management programs and to ensure orderly public and private development in the area.

The process allows local, regional, and state agencies to work together coordinated through the offices of the Department of Natural Resources (DNR), to prepare a coordinated plan for the designated Critical Area. The Critical Area planning process is not intended to be a substitute for local planning, but rather a supplement to ensure proper inter-governmental planning.

In 1988 Congress charged the secretary of the interior (through delegation to the National Park Service) with coordinating the efforts of the federal, state, and local governments to keep this 72-mile section of the Mississippi corridor

Figure 9.1: Critical Areas



in good condition and enhance its resources. Congress also mandated that a Mississippi River Coordinating Commission be appointed to assist the secretary in developing an integrated resource management plan for the national river and recreation area. The commission was appointed by the secretary in May of 1990 and collaborated with other agencies and groups to develop a plan for managing the river corridor. Congress directed the commission to assist the secretary, the state of Minnesota, and local units of government to develop policies and programs for:

1. The preservation and enhancement of the environmental values of the area
2. Enhanced public outdoor recreation opportunities in the area
3. The conservation and protection of the scenic, historical, cultural, natural, and scientific values of the area
4. The commercial use of the area and its natural resources, consistent with the protection of the values for which the area was established

The basic visions and concepts identified for the national river and recreation area promote extensive partnerships between the corridor's political entities and various constituencies to create the desired future and achieve the legislative purpose for the 72-mile-long corridor through the Twin Cities area. Natural features will be preserved, appropriate treatment of cultural resources will be ensured, economic resources will be protected, and public use will be enhanced.

The Comprehensive Management Plan adopts and incorporates by reference the state critical area program, shorelands program, and other applicable state and regional land use management programs that implement the visions and concepts identified for the corridor. The plan does not create another layer of government, but rather stresses the use of existing authorities and agencies to accomplish the policies and actions developed for the area. The plan will not prevent new development or expansion of existing development in the corridor that is consistent with state and regional land use management programs. The National Park service and the commission do not have approval authority over local plans and ordinances, and they do not have authority to approve or deny project specific land use decisions. The MNRRA legislation specifies that NPS regulatory authority in the Code of Federal Regulations, 36 CFR, only applies to lands that the National Park service owns – envisioned to be less than 50 acres.

The Critical Area Plan for Inver Grove Heights is intended to serve as both a separate document and also as a part of the City's Comprehensive Plan.

The River in Inver Grove Heights

The Mississippi River, although forming the entire 6 mile eastern border of the community, is somewhat removed from the community. There are a number of natural and physical features that create barriers for connections to the river. Roads and railroad tracks parallel the river form slivers of land that are isolated from surrounding neighborhoods. In the southern portion of the community steep bluffs and heavy vegetation create both physical and visual barriers. In addition to these barriers, public access to the river is limited. Most of the river frontage land is held in private ownership. The few public access points include four marinas in the northern portion of the corridor and River Front Park along River Road.

Inver Grove Heights is a transition area along the river corridor reflecting a change from urban to rural character. As such, the northern portion of the corridor is influenced largely by the development pattern of South St. Paul with small lot residential, commercial, and industrial uses. The southern portion of the corridor again, reflects the rural setting of its neighbor Rosemount. These changes in the land use intensity within the community require that the community address a number of diverse but interrelated issues.

The citizen's interest in the river is high despite the lack of accessibility. Public input received as part of the comprehensive plan update reinforced the public's desire to increase access to the river corridor. Many residents have stated that because of the lack of attractions along the river, they have not explored what it has to offer. Even with the large percentage of citizens desiring additional connections, some of the residents living along the river resist any effort to bring the public closer to their property. The sentiment of this group is that increased access would infringe upon their privacy.

Corridor Issues:

1. Increase Public awareness of the river and role it has in the community.
2. Improve public connections to the river corridor.
3. Address river corridor issues associated with the Concord Neighborhood Study.
4. Acknowledge the rights of private property owners allowing for the reasonable use of land when consistent with corridor objectives.
5. Preservation of open space and natural resources.

Background

The Critical Area in Inver Grove Heights encompasses approximately 3000 acres or less than 16 percent of the City's total land area. The boundary generally follows the navigable channel within the Mississippi River on the east and a boundary along the west starting from the common boundary of the City of Rosemount to the south. The boundary follows TH 56 north to the intersection with Inver Grove Trail, then the boundary follows Inver Grove Trail to the intersection with TH 56, then the boundary follows TH 56 to 70th Street. At this point the boundary generally lies about 1,000 feet west of Concord Boulevard or along the top of the bluff west of Concord Boulevard and north to a common boundary to the City of South St. Paul.

Existing Land Use

The land uses found within the Critical Area corridor identified below are wide-ranging. Existing land use types and conditions are indicated in the land use chapter. The type and intensity range from small lot single family residential to heavy industrial. There are three development districts within Inver Grove Heights critical area corridor (see Figure 9.1).

1. The Urban Development District comprises the northern one-third of the corridor and is the most densely developed with a mix of residential, commercial, and industrial uses. It is the oldest area in the city in terms of development as it was the original Village of Inver Grove Heights. It is entirely within the Metropolitan Urban Service Area (MUSA) and receives full urban services.

2. The Rural Open Space District has developed as rural estate lots with a minimum lot size of 2.5 acres. Typical urban services such as water, sanitary sewer, and storm water have not been available in the past. However, small portions of land guided for industrial development within the rural open space district have been included in the MUSA. Future urban services to this area are not envisioned to occur in the next 10 years. Further expansion of the MUSA within the rural open space district is not planned to be extended within the next 20 year planning period.

3. The Urban Diversified District has the smallest geographic area of the three districts. The rugged bluff topography has characterized the eastern half of this district. The western half is generally flat terrain which has encouraged the large scale industrial development to locate here

with an orientation to the US 52/TH 55 corridor. To the east is largely open space. The MUSA has been extended along US 52/TH 55 to encompass existing and guided industrial use. Urban services are not currently provided; however, infrastructure improvements are likely to occur in the near term as development warrants the need for urban services.

Transportation

The existing transportation facilities within the Critical Area corridor inhibit connections to the river. Major roadways include Concord Boulevard and US 52/TH 55 which parallel the river. Inver Grove Trail is a local collector through the estate residential area which provides connections to Concord Boulevard and US 52/TH 55 (see Figure 9.2). Seventy-ninth Street is the only public access connection linking River Front Park with Dickman Trail. The steep bluffs in the southern portion of the corridor have limited development and associated transportation facilities.

There are two railroad lines within the corridor both operated by the Union Pacific. One line provides connection to St. Paul and the other is rail siding for industrial uses in southern Inver Grove Heights and Rosemount. These two lines merge into one track in the area of 75th Street. The railroad also impacts the ability to make connections to the river in the northern two-thirds of the corridor. The railroad closely follows the river's edge through much of the corridor separating the riverfront residential from the rest of the community. There are a few railroad crossings which link paralleling roads and isolated residential areas including 71st Street and 79th Street. New crossings may be difficult given the existing roadway network.

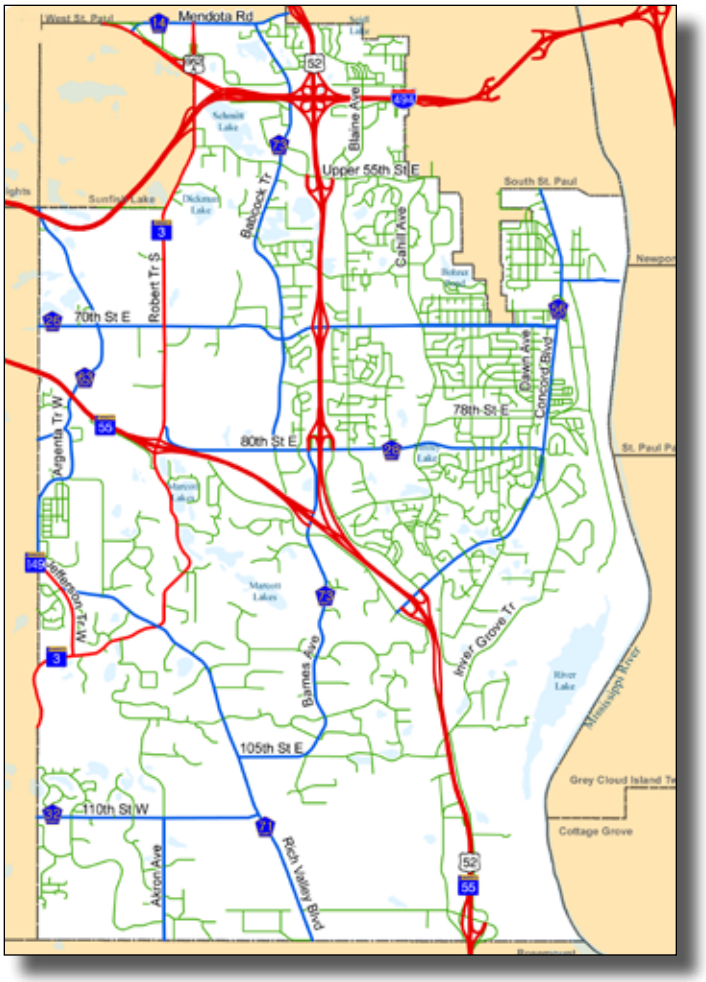


Figure 9.2: Transportation System

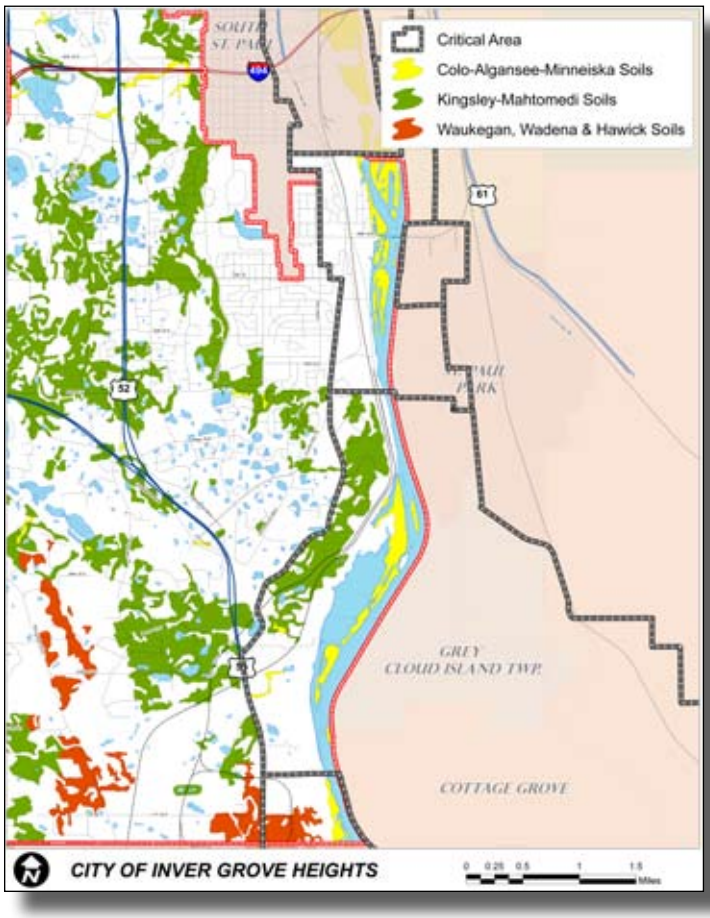


Figure 9.3: Soils located within the Critical Area

Soils

There are three general soil classifications within the Critical Area. The soils data is based on United States Department of Agriculture - NRCS Data (see Figure 9.3). The majority of the soils located within the critical area are described below:

- Colo-Algansee-Minneiska: Nearly level, poorly drained to moderately well drained soils formed in loamy, silty, or sandy alluvium; on flood plains of major rivers.

- Waukegan-Wadena-Hawick: Level to very steep, well drained and excessively drained soils formed in silty and loamy sediments over sandy outwash; on outwash plains and terraces.

- Kingsley-Mahtomedi: Gently sloping to very steep, well drained and excessively drained soils formed in loamy and sandy glacial till and sandy glacial outwash; on uplands and pitted outwash plains.

Slopes within the Critical Area vary greatly from low lying plains in northern areas to steep bluff slopes in the south. The severest slopes are generally found on land south of the Ordway Nature Center continuing south into Rosemount. Slopes in this area exceed 12 percent but are protected from erosion largely due to the dense vegetation. In addition to deterring erosion, the vegetation adds to the aesthetic beauty and provides habitat for wildlife.

Vegetation

In the Critical Area there are two areas of vegetation, upland hardwood forest and wetland forest. The upland hardwood forest consists of grasses and white, black, and red oak. Upland areas with potholes contain maples, basswood, elm, and boxelder. Wetland forest is found in low lying floodprone areas where soft maple, poplar, and elm prosper.

Wetlands

Wetlands within the Critical Area are found in the rural areas where the land

has remained in a somewhat natural state and on islands in the Mississippi River. They generally can be found along natural drainageways or in low-lying areas where ponding occurs. The National Wetlands Inventory identifies 19 wetlands within the Critical Area (see Figure 9.4).

Wetlands serve as important elements to the ecological system in supporting wildlife habitat and spawning areas. Disruption of wetlands will have an adverse effect on these systems. Alteration of wetlands in the form of filing or draining can increase flooding and runoff in other areas. For these reasons the Critical Area Plan does not permit altering of wetlands.

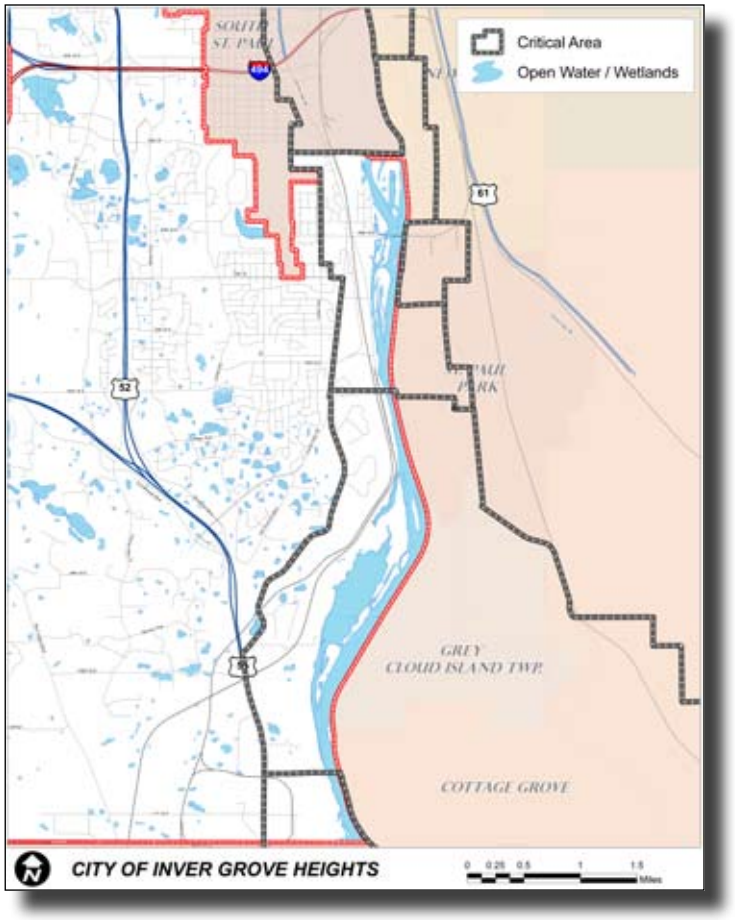


Figure 9.4: Wetlands

Source: National Wetland Inventory

Drainage

Natural drainage courses are an important element of the Critical Area that need to be protected. There are no major drainage courses other than the Mississippi River in the Critical Area. A number of smaller seasonal drainage courses can be found in valleys of bluff topography. Preservation of drainage courses is beneficial from a public investment standpoint as it reduces costs for storm sewers and other capital improvements.

Wildlife / Rare Species

The large amount of vegetation that exists through much of the corridor provides a suitable environment for many types of wildlife typical to the area. The Ordway Science Center studies many native species however, there does not appear to be any rare species as identified by the Dakota County Biological Survey.

MNRRA Plan & Policies

The future of the Mississippi River Critical Area within Inver Grove Heights will depend on community wide planning as well as those efforts specifically targeted for the corridor. The Comprehensive Plan establishes policies that attempt to better link the Critical Area to the rest of the community. The Critical Area Plan takes a more focused view, prescribing policies intended to meet the goals of Executive Order 79-19 as well as some that advance MNRRA

plan goals.

The land use policies related to the three development districts within the critical area corridor are as followed:

Urban Development District

The urban development district is the most urbanized portion of the corridor in Inver Grove Heights containing the most varied land uses within the critical area. The varied uses range from residential, commercial, industrial and recreational uses. The exiting land use and transportation patterns have made it difficult for planning efforts to be effective in changing the character of the corridor.

A neighborhood redevelopment plan for the Concord Neighborhood was completed early in 1998. The plan has a number of recommendations for land use and revitalization that are consistent with MNRRA objectives including areas of housing, business area redevelopment, street corridor aesthetic and safety improvements, marina improvements, and park and open space. The Concord Boulevard Neighborhood Plan is adopted by reference for this Critical Area Plan to provide additional background and insight for corridor related projects.

The land use plan recognizes the redevelopment plan for the Concord Neighborhood and the plan's recommendations by guiding the area for mixed use development. The intent of the mixed use category is to encourage or facilitate redevelopment and reinvestment along the corridor. Redeveloping in this manner has also taken into consideration its location within the urban development district. The land use plan has identified a set of guiding principles for the Concord Boulevard Corridor in addition to a set of mixed use area policies. Both set of polices have recognized its relationship to the Mississippi River.

Rural Open Space District

The rural open space area represents the largest policy area within the Critical Area extending from 80th Street to City Limits. Public utilities are not available in this area and are not planned in the future. However, small portions of land guided for industrial development within the rural open space district have been included in the MUSA.

The northern portion of the district is nearly built out with rural residential estates on minimum 2.5 acre lots. Few changes to this area are expected in the future in terms of public service delivery.

The southern portion of the district is planned for light industrial uses and has been incorporated into the MUSA. Due to the proximity to the Flint Hills Refinery and Highway 52/55, these uses have been long identified as reasonable for this area. Although the entire area south of the railroad tracks is identified as a Light Industrial Area, topography will limit development to the east along the state highway.

East of Highway 52/55 and west of the Mississippi River is the Pine Bend Bluffs which encompasses approximately 1,300 acres of woodland and dry prairie bluff lands. The Pine Bend Bluffs area offers majestic views of the river, a safe haven for wildlife habitat and provides shelter for native plants and ecosystems. The importance of preserving these resources has been recognized by the community and region as a whole. In 2003 the Minnesota Department of Natural Resources purchased numerous properties (see Figure 9.5) to be included as part of the Scientific and Natural Areas (SNA) Program (see Sidebar).

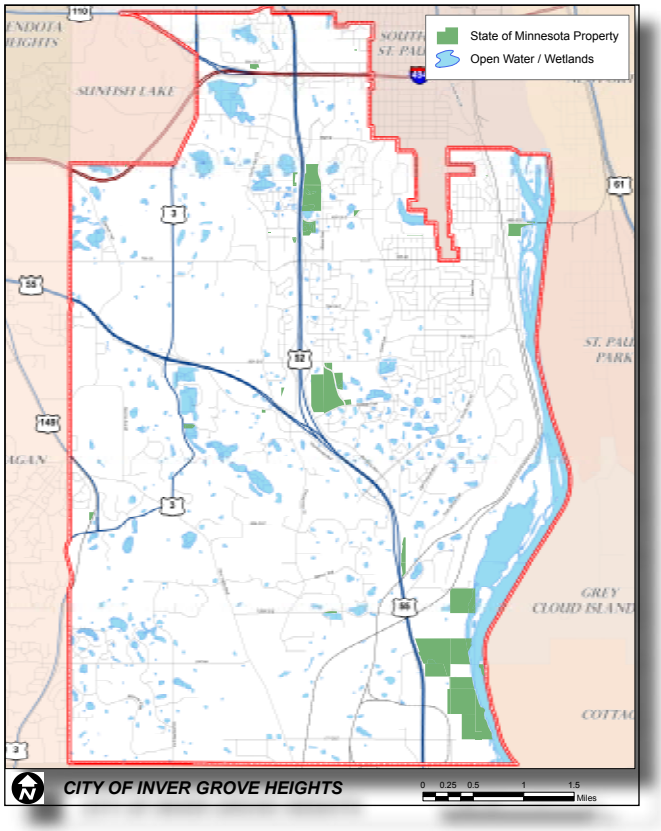


Figure 9.5: State owned property.

Scientific & Natural Areas (SNA) Program

The SNA program preserves natural features and rare resources of exceptional scientific and educational value. SNAs are open to the public for nature observation and education, but are not meant for intensive recreational activities. As a general rule there are no trails, restrooms, or other facilities. Pets are not permitted.

Source: Minnesota Department of Natural Resources

Urban Diversified District

Future land use plans for the urban diversified district are guided for light industrial and mixed uses. Mixed use is intended to capture redevelopment initiatives along the Concord Boulevard. Located east of Concord Boulevard is the Heritage Village Park. There remain two historic buildings, the old town hall and school house and property along the Mississippi that the City has been acquiring for the expansion of Heritage Village Park. The development of the park is discussed further in the parks and recreation chapter.

The City has adopted Critical Area Plans and Shoreland Management Ordinances that are intended to protect slopes and vegetation in bluff areas when development plans are reviewed.

Land Use Policies

1. Ensure consistency with all applicable federal, state, and local regulations for shorelands, floodplain, and wetlands. Update local codes as

necessary to reflect changes to laws that affect the river corridor.

2. Encourage planned unit development of new and redevelopment projects to ensure proper planning and attention to building design, open space, public infrastructure, and recreation facilities.
3. Identify land uses that are inconsistent with adopted land use plans and zoning ordinances and plan for their replacement or amortization.
4. Identify land uses that present hazards to the river corridor and work to minimize those activities that jeopardize the natural environment.
5. Continue to explore redevelopment initiatives along the Concord Boulevard as discussed in the land use chapter.
6. Continue to explore land acquisitions for the development of Heritage Village Park.
7. Collaborate with property owners, such as Macalester College and the Flint Hills Refinery, DNR and County to determine future open space, recreational activities and the preservation of lands within the critical area corridor.

Surface Water and Natural Resource Management Plans and Policies

The Mississippi River corridor provides the community with an abundance of natural resources that should be protected and enhanced. The comprehensive plan addresses a number of land use and environmental standards that should be maintained to prevent degradation of these resources. In developing additional regulations for the Critical Area, the City shall consider the following policies.

Surface Water and Natural Resource Management Policies

1. The City will continue to enforce the Critical Area Ordinance as amended to ensure land use performance and design standards.
2. The City will continue to enforce official controls such as the Shoreland Ordinance, Stormwater and Erosion Control Ordinance.
3. The City will continue to enforce the Floodplain Regulations.
4. Natural habitat shall be maintained to prevent erosion potential and to protect the overall health of the environment. Development plans should include a detailed inventory of trees and preserve as many as possible.
5. Wetlands shall be protected by controlling unnecessary runoff and erosion from adjacent lands. Storm water runoff into wetlands should be controlled to prevent filling through the use sediment traps.
6. Wildlife areas shall be encouraged in areas where suitable habitat exists to support native animal species.

7. Development shall be carefully regulated in areas where soils, bedrock, vegetation, topography, and other environmental concerns exist.
8. The City will continue to enforce a maintenance program that mandates regular inspections and pumping of septic systems.

Commercial Navigation and Economic Resources Plans and Policies

Commercial navigation of the Mississippi River is essential to the local, regional, and national economies for the movement of agricultural products and raw materials. Within the Critical Area of Inver Grove Heights, there are no provisions for barge fleeting or docking locations. Just south of the city's border in Rosemount is a large barge slip used by the Flint Hills Refinery for fuel loading. This slip has also been used by Cenex, located in Inver Grove Heights, over the years through an agreement. It would appear that as long as the slip can continue to provide for the needs of both industries, an additional slip may not be needed. Expansion of the current facility would be a more desirable alternative given topography and infrastructure issues with a new facility.

There has been a history of opposition from residents of Inver Grove Heights and the City of Newport on proposals for barge fleeting along the northern section of river in the city. Because of the views many of these residences are afforded, they feel barges will create an eyesore. Also within this section of the river are four marinas located north of the 66th Street Toll Bridge. The marinas are on secondary channel, tucked away from the navigable channel, keeping recreational boating and barge traffic somewhat separated.

Commercial Navigation and Economic Resources Policies

1. The City acknowledges barge fleeting is necessary for commerce and will work to provide areas if determined appropriate. Locations for future fleeting or loading should be removed from residential areas and the marina facilities to prevent conflicts with recreational boat traffic.
2. Work with the private marinas to secure shoreline to prevent erosion.
3. Utilize private marinas for public connection and access to the river.

Parks and Open Space

The future park and recreation plan identifies additional parks, trail systems and open space within the corridor. One of the major efforts the plan proposes is the creation of Heritage Village Park. The City has been acquiring additional

land to enhance the historical and recreational amenities to help bring people closer to the river. This area will include almost 80 acres of land north of 66th Street between the railroad tracks and the river. The park would be used primarily as a active park for historic displays, outdoor education, and would incorporate the County Regional Trail. Other open spaces in this area include islands and inland backwater areas. This creation of Heritage Village Park will provide a wide variety of recreation opportunities and provide better connectivity to the neighborhoods and businesses. With its close proximity to the river and adjacent residential neighborhoods in both Inver Grove Heights and South St. Paul, this area could become a regional resource helping bring people closer to the river.

Parks and Open Space Policies

1. Provide a park and recreation system that offers physical and visual connections to the river.
2. Provide trail links to regional trail systems and trails maintained by adjacent municipalities.
3. Utilize the Comprehensive Plan as a guide for the acquisition, development, and redevelopment of park and recreation facilities.
4. Seek opportunities to preserve open space areas to enhance the natural qualities of the corridor.
5. Enhance existing marinas and other water related facilities through site design improvements.

Katherine Ordway Natural Science Study Area

The Katherine Ordway Natural Science Study Area is owned by Macalester College and is used as an educational facility for studies at the college. Because of the sensitive areas within the facility, the public is kept out to prevent any possible damage to the natural features found there. The college has a large investment in maintaining this as a long-term study facility. There is some interest from the college in developing a relationship with the city's park programs to provide limited access to the facility for interpretive programs. A program like this could provide an excellent opportunity for people to learn about plant and animal species native to the area and experience a portion of the Mississippi River corridor that has remained in its natural state.

Future plans for the existing park facilities are detailed in the Parks and Recreation Plan.

Public Facilities and Public Land Ownership

There are no river crossing projects planned within the City's river corridor. Two area river crossings that serve a regional connection to the City are the I-494 Wakota Bridge and TH 61 Hastings Bridge. Both bridges are of large importance to the local communities and are in immediate need of improvements. Improvements to the Wakota Bridge are scheduled to be completed in the year 2010 which will include five lanes of traffic in both directions. Replacement of the Hastings Bridge is anticipated to begin in the fall of 2010.

During planning meetings with adjacent Dakota and Washington County communities, river crossings was identified as a common corridor issue that should be further coordinated. Because of the visual and functional impacts a bridge has on the surrounding river environment, steps should taken to ensure the design fits enhances the overall character of the river corridor. Preliminary design for these projects has not yet commenced. This provides some time to begin discussions between MN/DOT, County, and local communities to determine what urban design considerations are needed with these projects so they can be included in the Capital Improvements Plan (CIP).

Although these projects are outside of Critical Area in Inver Grove Heights, they will have an impact on the aesthetics of this corridor segment. The City should be an active participant in any river crossing project that attempts to address transportation and river aesthetic issues. In this way the City can better prepare itself for a future river crossing project.

Public land ownership also includes property owned by the City, County and the Minnesota Department of Natural Resources. The Pine Bend Bluffs is one of the largest publicly owned pieces of property in the critical area corridor. As previously noted, the DNR has recently purchased property as part of the Scientific and Natural Areas Program. These types of initiatives should continue to be pursued. In order to do so, the City will continue to collaborate with private and public land owners to preserve and protect lands within the critical areas.

Public Facilities and Land Ownership Policies

1. Increase public access to the corridor in areas with park facilities.
2. Coordinate with the Metropolitan Council and adjacent jurisdictions on

transportation issues to minimize river crossings.

3. Coordinate with the Metropolitan Council on potential barge fleeting facilities.

Implementation

The Critical Area Plan references projects that will be developed in accordance with the comprehensive plan and other projects that should be considered within the corridor. The implementation strategies address steps that should be taken over the life span of this plan (2030) to improve the overall corridor quality. Due to limitations in resources at the local level, the city should prioritize projects and seek additional funding when available. Projects that have the greatest potential to accomplish stated goals for the river corridor should receive the highest priority.

Heritage Village Park Concept.

Project #1

Continue to implement plans for the development of Heritage Village Park. The City should pursue funding mechanisms to acquire additional land for the development of Heritage Village Park that is consistent with the master plan. The expansion of the park should be coordinated and planned with Project #2, Bridge 5600.

Project #2

Seek outside grants and funding assistance for the acquisition and development of a viewing facility. In 2007, Washington and Dakota County initiated a study to explore reuse potential of Bridge 5600 on the Mississippi River. The City should continue to work with regional agencies to improve connections to the river.

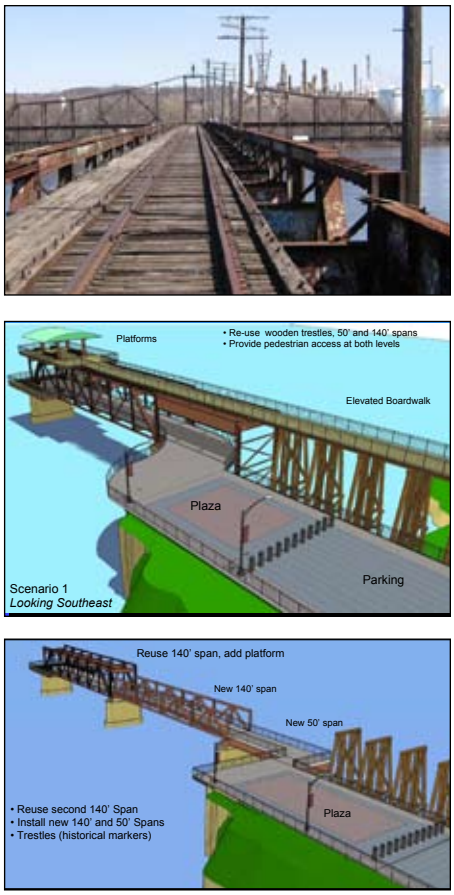
Project #3

Coordinate with the Katherine Ordway Natural Science Study Area to develop community programs. The City should pursue partnership with Macalister College in developing coordinated programs with the City's Park and Recreation Department. A partnership between the City and College should also be explored to establish how this resource

could provide educational opportunities to the community at large. A combination of funding from the Park and Recreation Department and Macalister College as well as staff time could be used initially to implement this project.

Project #4

Continue to support redevelopment efforts for the Concord Neighborhood. In 1998, the City adopted a redevelopment plan for the Concord Neighborhood, which has the highest concentration of older structures in the community. More recently, Dakota County has begun constructing upgrades to the roadway. The City should actively participate in planning redevelopment efforts that respect the goals and policies of the Critical Area Plan. Continued redevelopment planning in this corridor should seek to enhance the value of Heritage Park improvements and foster economic vibrancy and connectivity with the river corridor.



A photo of Bridge 5600 (top) and two alternative design concepts that were evaluated in 2007 for reuse of Bridge 5600 as a scenic overlook.

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Surface Water Management

CHAPTER 10

Introduction

This chapter is an excerpt from the City's Water Resource Management Plan (WRMP). The preparation of the WRMP coincided with the Comprehensive Plan and was adopted by the City Council on [INSERT DATE] of 2008. The purpose of this chapter is to summarize the WRMP and fulfill the requirements needed for the comprehensive plan update. The WRMP should serve as the City's guide to surface water management planning and implementation.

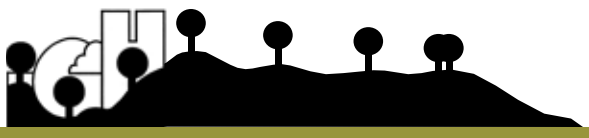
Water Resource Management Plan

The WRMP was created by BARR Engineering for the City of Inver Grove Heights in 2008.

WRMP Summary

The Inver Grove Heights Water Resources Management Plan (WRMP) sets the course for the City's management of the water resources and stormwater within the City. The WRMP provides data and other background information, outlines the applicable regulations, assesses city-wide and specific issues, sets goals and policies for the City and its resources, and lists implementation tasks to achieve the goals. The WRMP also provides information regarding the funding of the implementation program.

The WRMP presents a city-wide inventory, including land use, public utilities, climate and precipitation, topography, soils, geology, groundwater, MDNR public waters, wetlands, surface water resource monitoring information, water body classification, floodplain information, unique features and scenic areas, pollutant sources, and major basins and overall drainage patterns. This information can also be found throughout the comprehensive plan.



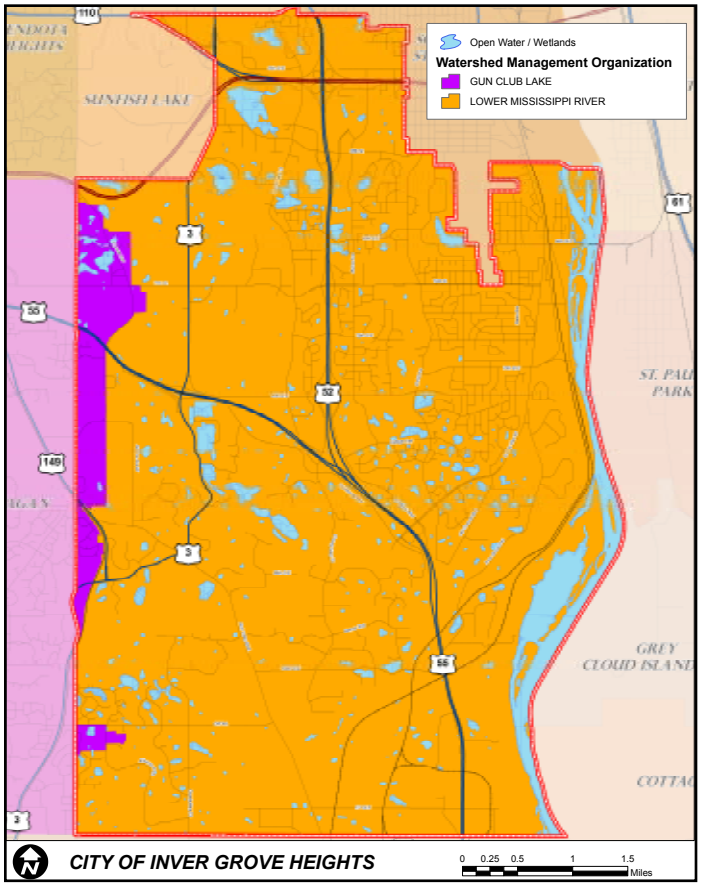


Figure 10.1: Watershed Management Organizations

Purpose

According to Minnesota State Statute 103B.201, the purposes of these water management programs are to:

1. Protect, preserve, and use natural surface and groundwater storage and retention systems;

2. Minimize public capital expenditures needed to correct flooding and water quality problems;

3. Identify and plan for means to effectively protect and improve surface and groundwater quality;

4. Establish more uniform local policies and official controls for surface and groundwater management;

5. Prevent erosion of soil into surface water systems;

6. Promote groundwater recharge;

7. Protect and enhance fish and wildlife habitat and water recreational facilities; and

8. Secure the other benefits associated with proper management of surface and ground water.

This WRMP will guide the City of Inver Grove Heights in protecting, preserving, and managing its surface water resources and stormwater system. The plan meets the requirements of Minnesota Statutes 103B.235, Minnesota Rules Chapter 8410, and the watershed organizations with jurisdiction in the City, which are the Lower Mississippi River Watershed Management Organization (LMRWMO) and the Gun Club Lake Watershed Management Organization (GCLWMO) (see Figure 10.1).

Water Resource Management Plan Goals

The WRMP has identified a series of goals related to water quality of lakes and ponds, stormwater runoff quality, rates and volumes, floodplain management, erosion and sediment control, wetland management, recreation, habitat and shoreland management, education and public involvement, groundwater and funding. These goals are as followed:

Water Quality of Lakes and Ponds

Goal 1: Water bodies designated as lakes by the City will be managed to meet the City's water quality criteria for non-degradation of water quality, with allowance for natural variability.

Stormwater Runoff Quality, Rates, and Volumes

Goal 1: Operate, manage, and maintain the City's stormwater system to ensure proper functioning of the system and to meet the requirements of the City's NPDES Phase II MS4 Permit and other agency requirements.

Goal 2: Improve the quality of stormwater runoff reaching the Mississippi River by reducing nonpoint source pollution (including sediment) carried as stormwater runoff.

Goal 3: Minimize flood damage to residential, business, commercial and public structures and property, and protect against increased flooding caused by land disturbing activities and other projects.

Goal 4: Reduce volumes of stormwater runoff and the amount of impervious surfaces in the developed parts of the City.

Goal 5: In the Northwest Area - limit the rates and volumes, and increase the treatment of stormwater runoff, by managing stormwater runoff as close to its source as possible and mimicking the system's natural hydrology.

Floodplain Management

Goal 1: Minimize flood damage to residential, business, commercial, and

National Pollutant Discharge Elimination System

The NPDES As authorized by the Clean Water Act, controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal and other facilities must obtain permits if their discharges go directly to surface waters..

Municipal Separate Storm Sewer System

MS4 is a term used under the Clean Water Act to identify larger communities that operate their own separate storm sewer system. Inver Grove Heights is an MS4 community.

public structures and property, and protect against increased flooding caused by land disturbing activities and other projects.

Erosion and Sediment Control

Goal 1: Prevent erosion and sedimentation to the greatest extent possible.

Goal 2: Regulate land-disturbing activities to protect against erosion and sedimentation.

Goal 3: Implement soil protection and sedimentation controls to maintain health, safety, and welfare.

Wetland Management

Goal 1: Preserve wetlands for water retention, recharge, soil conservation, wildlife habitat, aesthetics, and natural enhancement of water quality.

Goal 2: Achieve no net loss of wetlands, in conformance with the Minnesota Wetland Conservation Act (WCA) and associated rules (Minnesota Rules 8420).

Recreation, Habitat and Shoreland Management

Goal 1: Protect and enhance fish and wildlife habitat and recreation opportunities, and maintain shoreland integrity

Education and Public Involvement

Goal 1: Increase public support of the City's stormwater and water resource related efforts.

Goal 2: Inform the public about the City's water resources and stormwater system, including their use, protection, and management.

Goal 3: Raise public awareness regarding the steps they can take to reduce pollutants in stormwater runoff.

Goal 4: Involve the public in stormwater management programs and decision-making.

Goal 5: Perform public education and outreach, and invite public participation and involvement consistent with the City's NPDES Phase II MS4 Permit.

Groundwater

Goal 1: Protect the quality and quantity of the City's groundwater resources.

Funding

Goal 1: Achieve fair/equitable funding of the costs of the City's stormwater system incurred by property owners, developers and the City.

Water Resource Management Related Agreements

The City of Inver Grove Heights has entered into the following water resource management related agreements:

Joint Powers Agreement establishing the Lower Mississippi River Watershed Management Organization (LMRWMO) - the original joint powers agreement between the seven member cities (including Inver Grove Heights) went into effect in 1985. The revised and restated joint powers agreement was developed and signed in 2001, after LMRWMO adoption of the second generation watershed management plan.

Joint Powers Agreement establishing the Gun Club Lake Watershed Management Organization (GCLWMO) - the original joint powers agreement between the three member cities (including Inver Grove Heights) went into effect in 1985.

Joint Powers Agreement with the City of Eagan - regarding the Southern Lakes water tower, which includes discussions about storm sewers.

Assessment of Problems and Issues

The WRMP presents and discusses the status of problems and issues in the City, in the following topic areas: water quality, stormwater runoff rates and volumes, erosion and sediment control, and adequacy of existing programs.

Water Quality

The WRMP discusses general stormwater runoff quality issues (e.g., nonpoint source runoff and phosphorus loadings), impaired waters and TMDL issues (e.g., reaches of the Mississippi River on the impaired waters list, and MPCA impaired waters listing criteria according to ecoregion), and specific water quality issues.

Stormwater Runoff Rates and Volumes

The WRMP discusses general issues (e.g., impacts of land development on stormwater rates and volumes, landlocked basin issues, flooding damages, and floodplain management) and specific issues (e.g., intercommunity issues—Schmitt Lake, Seidls Lake, Dawn Way and 59th Street, Bohrer Pond, Trailer Court Pond, Babcock Trail, Argenta Trail Drainage Basin, Eagan Drainage Basin, and Interstate Valley Creek); and local city issues—properties in the floodplain of the Mississippi River in the Old Village/Concord Boulevard neighborhoods, provision for future discharge from Babcock Trail and Valley Park drainage basins into the South Grove drainage basins, Marcott Lakes high water levels, and citizen-identified drainage issues).

Erosion and Sediment Control

The WRMP discusses the general causes and impacts of erosion and sedimentation, specific examples of erosion and sedimentation problems in the City, the City's implementation and enforcement of its ordinances and approval processes pertaining to erosion and sediment control, and the NPDES construction permit.

Adequacy of Existing Programs

The WRMP discusses the adequacy of the City's ordinances and official controls, including a description of the City's stormwater guidance document for the Northwest Area (Inver Grove Heights Stormwater Manual Northwest Area (December 2006), the LMRWMO and GCLWMO classification systems, the City's education and public involvement program, maintenance of the City's stormwater system, groundwater protection, and the City's capital improvement and implementation programs.

Implementation

The WRMP has identified a series of polices based on the plan's goals. These polices are adhered to as part of the comprehensive plan update. A summary of those policies are as followed :

Water Quality of Lakes and Ponds Policies

The WRMP includes policies that reference the City's lake classification system, which is presented in Section 2. Specific policies call for the City to: recruit volunteers to collect water quality data for the City lakes; use the monitoring data to determine appropriate lake management actions; address future total maximum daily load (TMDL) requirements; and to require or seek opportunities to provide pretreatment of stormwater runoff.

Stormwater Runoff Quality, Rates, and Volumes Policies

The WRMP includes policies pertaining to the City's NPDES Phase II MS4 Permit and SWPPP, including the City's preparation of a loading assessment and nondegradation report.

The WRMP also includes policies requiring implementation of best management practices (BMPs) to reduce total suspended solids and total phosphorus by 85% and 55%, respectively; requiring submittal of stormwater management plans for land alteration and development activities; requiring infiltration of the first 0.5 inch of runoff from new impervious surfaces; requiring implementation of low impact development techniques in the Northwest Area and considering their implementation in other parts of the City; requiring developers follow the City's stormwater guidance document for the Northwest Area; requiring the placement of skimming devices at pond outlets; requiring post-development peak discharge rates to not exceed existing discharge rates for the 2-year, 10-year, and 100-year events; requiring 10-year "level of service" and 100-year level of protection for the City's stormwater system; describing the City's response to citizen-identified drainage issues; and requiring WMO review and approval of projects with intercommunity impacts.

Floodplain Management Policies

The WRMP includes policies calling for the City to implement and enforce its ordinances to prevent/minimize flood damages, including lowest floor elevation requirements (with special requirements for landlocked basins); removal of structures in the Mississippi River floodplain in the Old Village/ Concord Boulevard neighborhoods on a willing seller basis as properties come up for sale; and to consider recruiting volunteers to monitor water levels on City lakes.

Erosion and Sediment Control Policies

The WRMP includes policies regarding the City's general requirements for preparation and submittal of erosion and sediment control plans; calling for City inspection of projects; and calling for the City to collect a cash surety.

Wetland Management Policies

The WRMP includes policies regarding the City's role as the local government unit responsible for administering the Wetland Conservation Act. The WRMP calls for the City to complete a phased wetland inventory and assessment, implement wetland management standards in the Northwest Area and consider implementing such standards in other areas of the City, and develop a new wetlands ordinance.

Recreation, Habitat and Shoreland Management Policies

The WRMP includes policies calling for the City to; continue enforcing its shoreland ordinance and Critical Area Plan; implement natural resource management standards in the Northwest Area and consider implementing such standards in other areas of the City; maintain existing public access to City lakes and seek to obtain easements for passive access to lakes where there is currently no access (i.e., during development or redevelopment); consider performing natural resource inventories; and consider identifying disturbed shoreland areas.

Education and Public Involvement Policies

The WRMP includes policies calling for the City to implement the education and public involvement-related BMPs identified in the City's SWPPP for its

NPDES Phase II MS4 permit, to consider recruiting and training volunteers for monitoring and other activities, and to incorporate public involvement and pubic education efforts into all of the City's significant proposed projects.

Groundwater Policies

The WRMP includes policies calling for the City to prepare a wellhead protection plan (when required), encourage groundwater recharge and protect groundwater recharge areas, and to implement its Individual Sewage Treatment System (ISTS) ordinance.

Funding Policies

Adequate funding is essential for the City to implement its WRMP policies. The WRMP includes policies calling for the City to consider developing a stormwater utility, request and receive cost sharing from the LMRWMO for intercommunity water resource projects; and seek LMRWMO assistance in determining cost allocations for intercommunity projects.

Implementation Program

The implementation program describes the significant components of the City's WRMP implementation program, including its NPDES Phase II MS4 permit, operation and maintenance of its stormwater system, education and public involvement, funding, design standards, ordinance implementation and official controls, implementation priorities, and WRMP update and amendment procedures.

The implementation section provides a detailed program, which includes project descriptions, cost estimates, potential funding sources, and proposed years of implementation.

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Implementation

CHAPTER 11

Shaping the Future

The Inver Grove Heights community has spent a great deal of time and energy updating its comprehensive plan. The implementation chapter is intended to carry out the vision and guiding principles that were crafted at the beginning of the planning process. To be most affective, the plan must serve both long term and near term needs. Chapter 11, Implementation, is organized around a series of general strategies and more specific action steps. Strategies are continuous and have no defined start or end point. Strategies emphasize utilization of the plan as an every day planning tool. Action steps are specific projects that have a defined start and end point and result in a tangible product or capital investment.

It is important to recognize the plan as a living and breathing document. The plan provides the flexibility to adapt to unforeseen changes. Changes may include new development products in the market place, shifts in the regional, national or global economy, technological advances and political decisions that force us to rethink our vision from time to time. On a smaller scale, individual property owner decisions (or needs) also force change. Small incremental changes must be carefully evaluated relative to a community's vision and guiding principles.

Implementing the Comprehensive Plan is a collective effort between the Inver Grove Heights City Council, the various boards and commissions that advise the Council and City Staff.

The following sections highlight community strategies and action steps.

Vision Statement:

At the beginning of this plan, Inver Grove Heights vision was presented. It is appropriate to repeat the vision statement because the ideas embodied in the vision statement establish the framework for the implementation strategies and action steps.

Inver Grove Heights will be a community that maintains a unique position in the Twin Cities area by providing a development pattern that accommodates both urban and rural lifestyles.

Future growth and development will reflect the heritage of the community. The city will have a quality built environment that respects and reflects its natural environment of open spaces, rolling meadows, wooded areas, lakes and wetlands.

Inver Grove Heights will accommodate the needs of its diverse population by providing a variety of housing types, employment opportunities and a range of goods and services.

Inver Grove Heights will be an attractive, safe community that evokes a strong expression of community pride and a healthy environment that encourages people to live, work and recreate.

Community Strategies

Periodically Review and Understand Community Development Tools and Programs

Many of the tools available to the City of Inver Grove Heights for community planning and development are enabled by state laws such as: zoning and subdivision ordinances, park dedication ordinances, infrastructure ordinances, ability to create or establish tax increment financing districts, to use tax abatement or other financing mechanisms or environmental reviews. These are only a few of the important implementation tools available to Cities.

Allocation of Staff Resources

The City should continue dedicating staff resources to implementing community strategies and staying familiar with state laws and rules.

A key strategy for Inver Grove Heights is to regularly review state laws to stay abreast of changes that might favorably or adversely affect the City's ability to implement its plan. This can be done by subscribing to newsletters or e-mail blasts through such organizations as the League of Minnesota Cities (LMC), Minnesota Chapter of the American Planning Association (MnAPA), Metro Cities or the Economic Development Association of Minnesota (EDAM) just to name a few.

Conduct Regular Reviews of the Comprehensive Plan

Inver Grove Heights will continue to grow and change over the next 20 years. As this growth continues to occur, data will emerge through evaluation of development projects and planning analysis that will help with understanding the impacts on the community. The Comprehensive Plan should be reviewed on a regular basis (annual or biannually) to assess progress on attaining the community's goals and objectives and to continue a dialogue about the community's future. The review should focus on both the successes and failures of the Plan. The review should be informed by development projects, observations of change and technical analysis. GIS mapping should be maintained and annual adjustments to population, household and employment projections should be carefully evaluated in collaboration with the Metropolitan Council.

Adjustments to Demographic and Employment Projections

As new development occurs and the economy shifts, demographic and employment projections should be reviewed. Through this Comprehensive Plan update, the City is equipped with the necessary GIS mapping and spreadsheet tools to closely monitor land inventory and development projections.

Establish a Set of Community Indicators to Measure Progress

Community indicators are an effective measurement tool to assess how Inver Grove Heights is progressing towards its goals and objectives identified throughout the plan. "In essence, indicators are measurements that reflect the interplay between social, environmental, and economic factors affecting a community's well-being (American Planning Association)." The City of Inver Grove Heights should establish a series of indicators to evaluate the progress and success of this plan.

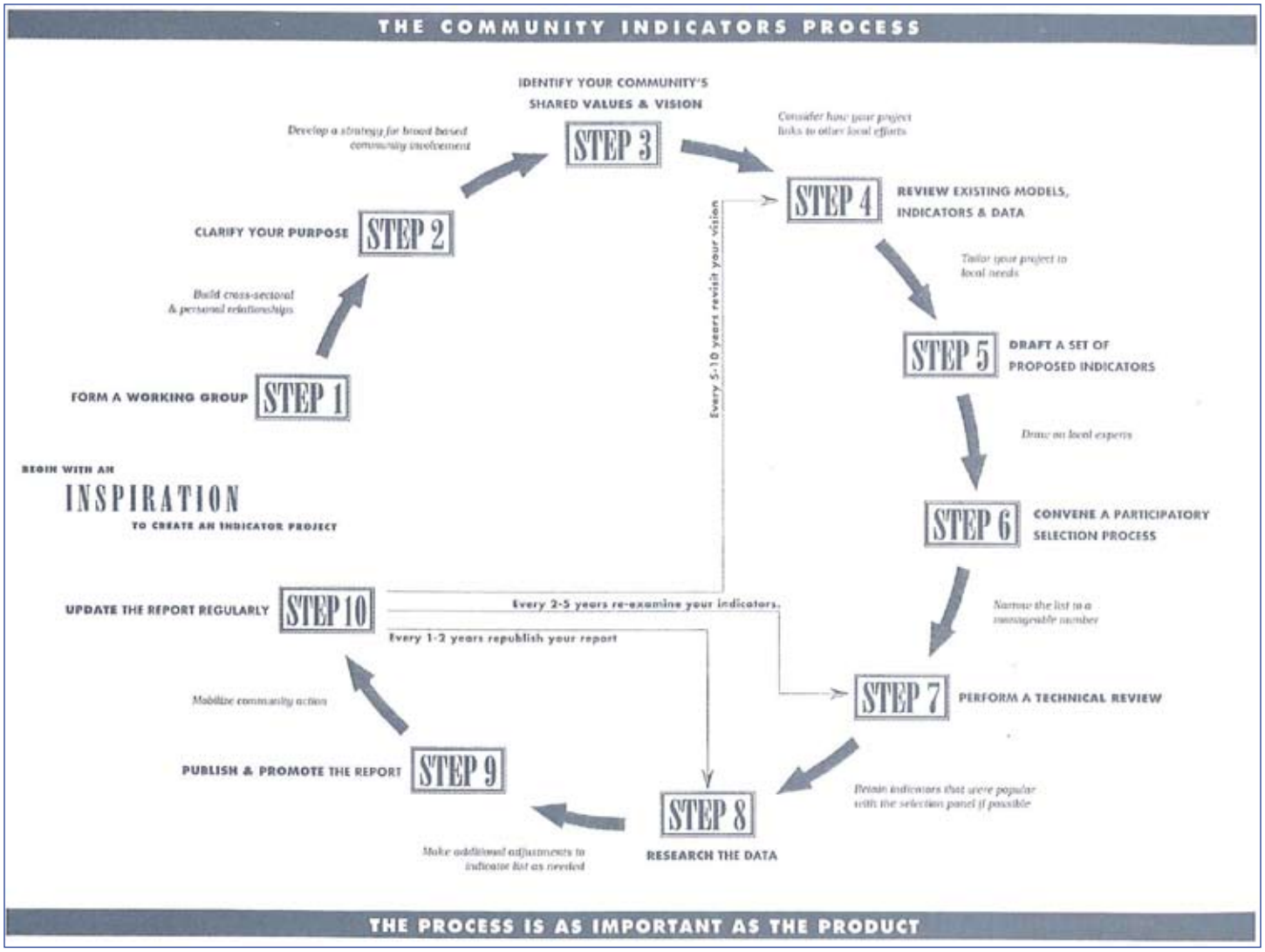


Figure 11.1 A process for identifying community indicators. Source: Planning Advisory Services Report #517 American Planning Association

Agreeing upon a series of community indicators will require a public process. Figure 11.1 depicts a process that was developed by the American Planning Association. The 10 step process provides a community with the tools necessary to formulate effective community indicators. This is a long term strategy that will provide the City of Inver Grove Heights with a wealth of information to help guide future decision making.

The list of community indicators can be quite lengthy and exhaustive. This is why the process is as important as the product. What gets measured and how it gets measured must be a product of a community dialogue. The following list is a starting point of some possible indicators relevant to Inver Grove Heights. This list is developed based on past community input and recent planning trends:

Land use efficiency as measured by:

- density of new residential development
- ratio of commercial building square feet to gross land area of new construction
- total acres of new development absorbed on an annual basis
- total acres of projects zoned as a Planned Unit Development

Economic development

- number of existing businesses visited by City Staff or economic development agency
- number of new businesses developed in the community
- number of new jobs created (private vs. public)
- number of new start up businesses
- vacancy rates of commercial and industrial space
- unemployment rates
- valuation trends of commercial and industrial businesses
- size of local/regional labor force
- the ratio of jobs in Inver Grove Heights to the number of housing units

Housing

- number of new affordable housing units developed
- number and value of permits pulled for housing maintenance (siding, roofing, mechanical, windows, etc...)
- number and value of permits pulled for new housing construction (by type--detached SF, attached MF, stacked MF)
- number and value of permits pulled for housing remodeling/expansions
- number of real estate transactions of owner occupied housing
- vacancy rates
- dollars invested in assisting with housing maintenance

Government services

- number of candidates filing for government offices
- number of complaints logged at city offices
- average timeliness of city resolution
- number of city employees per 1,000 residents
- number of police calls by type/area or location
- number of fire calls by type/area or location
- average response times of each call
- number of joint service agreements or public private partnerships
- satisfaction rating change over time

Environment and energy conservation

- water quality of key lakes and the Mississippi River
- air quality measurements taken at key locations in the community
- number of new storm water treatment systems installed or volume of storm water treated
- acres of sensitive natural resources protected
- number of new buildings LEED certified
- number of vehicles in the city fleet that operate on alternative fuel sources (i.e. bio-desiel, solar, hybrid)
- volume of waste generated per capita
- percent of waste stream recycled per capita
- carbon footprint measurement

Transportation/traffic/mobility

- lane miles of congested roadways (LOS E or F)
- number of traffic accidents by type
- number of lane miles of new roadways built (and dollar value)
- number of lane miles of streets reconstructed (and dollar value)
- traffic volumes on major streets
- number of pot-holes repaired or volume of fill on an annual basis
- volume of transit ridership from the City and destinations
- number of cars per household
- miles of pathways constructed by type (sidewalk or multi-purpose trails)
- miles of bike lanes constructed
- household trip patterns (bike, walk, drive, transit)
- percent of households within walking distance of key destinations

Park and recreation

- participation in active recreation programs
- dollar value of investments in existing parks
- hours spent on park maintenance
- number of new parks developed
- change in programing over time

Community infrastructure

- miles of new sanitary sewer pipes and number of lift stations
- volume of inflow and infiltration
- miles of new trunk water mains and number of new city wells
- volume of unaccounted for public water usage
- per capita useage of water by land use
- number of wells
- volume of water treated

State Statute 473.865

According to Minnesota Statutes 473.865, Subd. 3, communities have nine months from the adoption of their comprehensive plan by the City Council to bring their local controls into alignment with the comprehensive plan.

It is also important to note that the judicial system has cited inconsistencies between the Comprehensive Plan and Zoning Ordinance when ruling against the community in a zoning dispute. Thus, one of the first implementation initiatives should be a thorough review of the Development Code to identify where changes are needed to bring it into alignment with the Comprehensive Plan.

Official Controls

Inver Grove Heights City Code, which contains its Zoning and Subdivision Regulations, is the official regulatory tool to implement the Comprehensive Plan. The Comprehensive Plan provides the "nexus" to the specific laws in the City's ordinances and allows implementation of ideas that help the City reach the goals that are outlined throughout the plan. The City's existing zoning map (2008) and list of zoning districts are provided in Figure 11.2 and Table 11.1. According to Minnesota Statutes 473.865, Subd. 3, communities have nine months from the adoption of their comprehensive plan by the City Council to bring their local controls into alignment with the comprehensive plan. This process will require a public process before any changes are made. Minor changes to the zoning code and zoning map districts will be required following adoption of the comprehensive plan. These areas are addressed below:

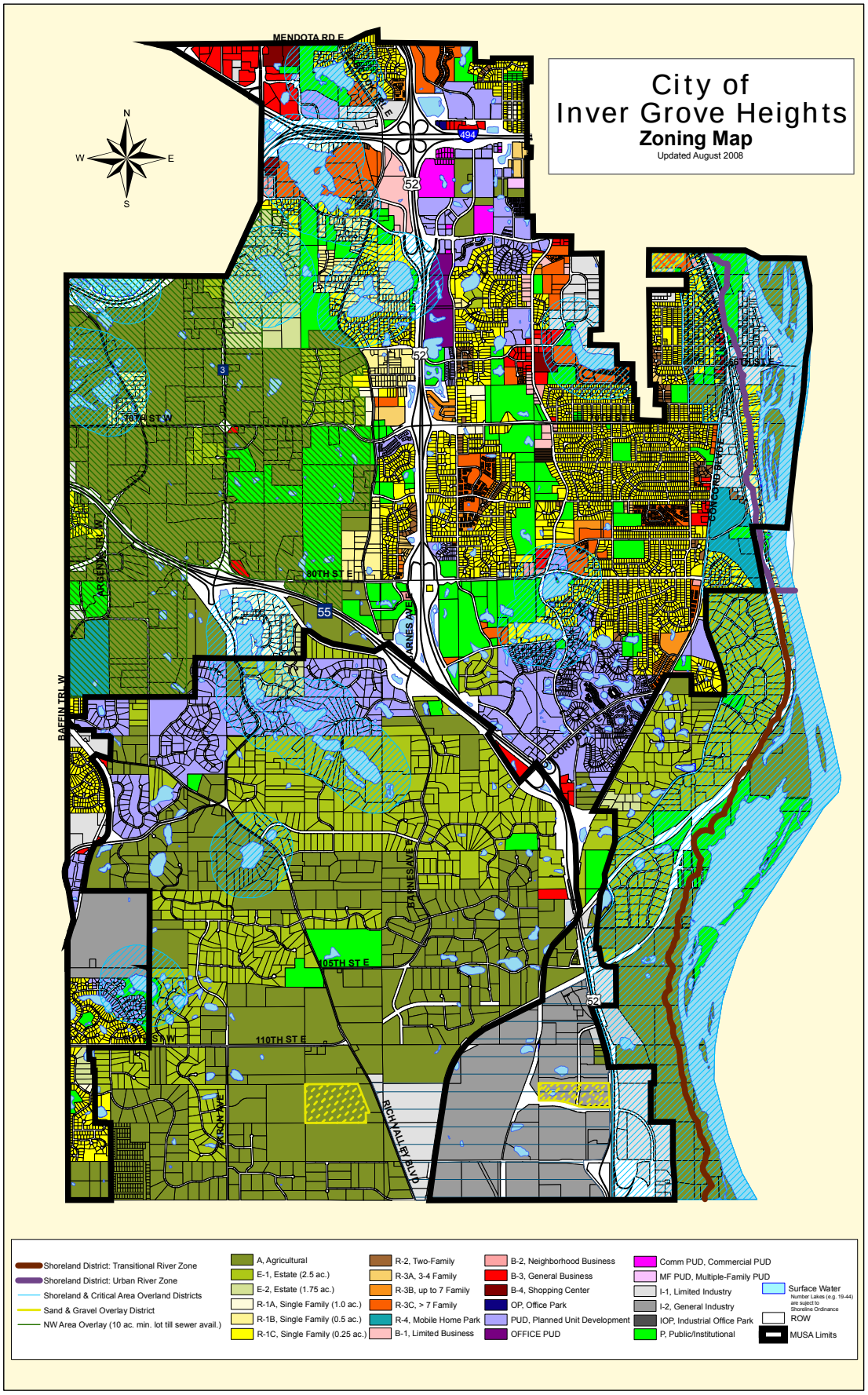
- Development of a new zoning district to establish the Industrial Open Space area--This zoning district will be required to protect land within the designation and to enable existing development to continue operating.
- Park dedication-the subdivision ordinance contains provisions for park dedication. The park chapter provides a long term plan for future park and trail improvements that (in conjunction with the Park and Trail Master Plan) form the nexus for establishment of park dedication. Park dedication should be reviewed on a regular basis.
- Inclusionary housing--inclusionary housing was presented in the housing chapter. The city should evaluate the possibility of incorporating policies into the zoning code that remove barriers to the development of affordable and workforce housing.
- Access management--functionality of major road corridors can be greatly enhanced by the ability to regulate access onto roadways. Development of an access management ordinance strengthens the City's ability to implement and enforce access management strategies.
- Zoning map amendments--a limited number of areas with the community will be affected by the changes in land use guidance. These areas will need to be rezoned accordingly through the rezoning process which requires a public hearing.

The entire comprehensive plan will be evaluated to ensure the official controls are aligned with one another. If changes to the official controls are needed, the City will proceed with the appropriate process required by state law.

Table 11.1 Existing Zoning Districts (2008)

Zoning District	Density	Minimum Lot Size
Agricultural	1 unit per 5 acres	5 acres
"E-1" Estate District	1 unit per 2 1/2 acres	2 1/2 acres
"E-2" Estate District	1 unit per 1 3/4 acres	1 3/4 acres
"R-1A" One-Family Residential District	1 unit per 40,000 sq.ft.	40,000 sq.ft.
"R-1B" One-Family Residential District	1 unit per 20,000 sq.ft.	20,000 sq.ft.
"R-1C" One-Family Residential District	1 unit per 12,000 sq.ft. (interior lot) 1 unit per 12,500 sq.ft. (corner lot)	12,000 sq.ft. (interior lot) 12,500 sq.ft. (corner lot)
"R-2" Two-Family Residential District	2 units per 15,000 sq.ft.	15,000 sq.ft.
"R-3A" Multiple Family Residential District	3 to 4 unit buildings with up to 6 dwelling units per acre	7,260 sq. ft. per unit
“R-3B” Multiple Family Residential District	Up to 7 units per building with densities ranging up to 12 dwelling units per acre.	3,630 sq. ft. per unit
“R-3C” Multiple Family Residential District	More than 7 units per building and densities greater than 12 dwelling units per acre	2,000 sq. ft. per unit
“R-4” Mobile Home Park District	1 unit per 5,000 sq. ft.	5,000 sq. ft. per unit
“B-1” Limited Business District	N/A	10,000 sq. ft.
“B-2” Neighborhood Business District	N/A	1 acre
“B-3” General Business District	See City Code	See City Code
“B-4” Shopping Center District	N/A	10 acres
PUD (including Northwest Area Overlay)	Based on Comprehensive Plan	varies
“OP” Office Park	N/A	20 acres
“IOP” Industrial Office Park	N/A	1 acre
“I-1” Limited Industry District	N/A	1 acre
“I-2” General Industry District	N/A	1 acre
“P” Institutional District	See City Code	See City Code

Figure 11.2: 2008 Existing Zoning Map



Financial Resources

Implementation of the Comprehensive Plan requires a combination of public and private actions, many of which require public investment. While there is not a bottomless pot of money to tap into, there are a variety of financial resources available to implement the Comprehensive Plan. The City's Capital Improvement Program (CIP) is an important tool for prioritizing public investments. The City's CIP will need to be continually updated and reviewed on an annual bases.

The Comprehensive Plan has taken into consideration a series of planned improvements that were identified in the City's CIP and are supported through the Comprehensive Plan update. These projects were principally identified in chapters 5-Transportation, 7-Sanitary Sewer and 8-Water Supply. CIP projects that are related to surface water management projects can be found in the official CIP for the City and the Water Resources Management Plan completed in 2008. Table 11.2 provides a list of key CIP projects.

Table 11.2: Capital Improvement Program (CIP)

Chapter	Project
5. Transportation	Upper 55th Street - Robert Tr. to Babcock Tr.
	Cahill Avenue - Upper 55th St. to Concord Blvd.
	Concord Boulevard - Corcoran Path to City limit
	Cliff Road (CSAH 32)/Rich Valley Blvd. to (CSAH 71)/117th St.
	Akron Avenue (CSAH 73) - Cliff Road to Rosemount
	Alverno Avenue - Argenta Tr. to Rich Valley Blvd.
	80th St. (CSAH 28) - Robert Tr. to 0.6 miles east of Robert Tr.
	70th St. (CSAH 26) - Eagan to Babcock Tr.
7. Sanitary Sewer	North Robert Trail Trunk Sewer Improvements
	Southern Argenta Trunk Sewer, Lift Station and Forcemain System
	Averno Trunk Sewer, Lift Station and Forcemain System
	Northwest Argenta Trail Sewer, Lift Station & Forcemain System
8. Water Supply Plan	Northwest Area Water Extensions (Distribution System Improvements and Easements)
	Well and Well House Improvements (2010-2030)

The CIP is one of several financial tools that may be used to implement specific initiatives. However, financial tools of today may become outdated and should be reviewed on a regular bases. City staff and decision makers will need to retain a current working knowledge of all the tools that can be used. To help serve as a resource, a list of some of the more common financial tools are provided in Table 11.3.

Table 11.3: Common Community Development Financial Resources

Topic	Funding Resource
Redevelopment/ or Economic Development	Livable Communities Grant Program
	Tax Increment Financing
	Tax Abatement
	EDA Levy as authorized by state statute
	Special service districts/Business Enterprise Zones
	Environmental Clean up grants/loans through the MPCA or other agency
Housing	Community Land Trust
	Community Revitalization Fund (CRF)
	Community Development Block Grant funds (CDBG)
	EDA/HRA Levy as authorized by state statute
	Livable Communities Act
	Home Program
	Minnesota Housing Finance Agency Programs (MHFA)
Transportation	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)
	Safe Routes to School
	County State Aid System
	Cooperative Agreements
Parks and Recreation	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)
	Minnesota Department of Natural Resources (DNR) Grants

Transportation (Right-of-Way Preservation)

The transportation plan has identified a series of roadway improvements that are needed to meet local and regional needs over the next 20 years. Implementing these improvements could be one of the most challenging efforts as each one will have an infrastructure cost associated to them. The recommended improvements at this time do not have a funding source associated with them. However, it is important to continue to plan for these improvements as infrastructure and land costs continue to rise. This in turn enhances the importance of right-of-way preservation.

The City's strategy for preserving right-of-way (ROW) for long term transportation projects is to work collaboratively with property owners to ensure that development projects take into consideration both short and long term transportation needs. This may require the City taking a more proactive planning role, engaging regional agencies (Dakota County and MnDOT) and affected land owners in more detailed master planning and system planning efforts. Planning for local, county, and state roadway connections in the Northwest Area is the primary example of this need.

The City will continue to work with the County, Minnesota Department of Transportation and the Metropolitan Council to determine the appropriate planning and funding mechanisms for constructing roadway improvements.

Housing

The housing chapter has identified a series of action steps (see sidebar) that need to take place in order to meet local and regional housing needs. From those action steps, the City will need to continue to explore ways to provide housing options for all income levels and lifestyles. Affordability is an important component to the overall housing plan. The City will need to work to reduce the barriers that are not conducive to affordable housing and work to dispel the myths of affordable housing. A housing action plan should be developed to address housing issues in a more detailed manner.

Housing Action Steps

A. Conduct a critical review of development regulations and processes to reduce barriers to affordable housing.

B. Conduct an education campaign to help dispel myths of affordable housing and recognize the community benefits.

C. Prepare a detailed housing action plan.

Economic Development

Economic development in Inver Grove Heights has historically been facilitated through a collaborative environment with the Chamber of Commerce and a non-profit organization, Progress Plus. The Cities economic development strategy includes a continued partnership with the business community through participation in the Chamber and Progress Plus. At the same time, the significance that community development has on a city's ability to foster a strong economic development climate suggests that economic development cannot be solely focused on business recruitment and retention. Instead, a

strong economic development program must include an integrated planning environment that focuses on improving Inver Grove Heights' overall quality of life, attracting a diverse and ample labor force and providing the services and amenities that businesses, employers and employees look for when deciding to locate in a community. Inver Grove Heights has tremendous assets to promote a strong economic climate including a diversity of housing types, quality park and recreation system, connections to regional transportation systems, the Mississippi River and natural resource areas nearby, proximity to an International Airport and proximity to the downtown core of the Twin Cities.

The City should develop an economic development action plan that emphasizes this strategy and outlines key action steps with measurable results (see community indicators.) The City has an Economic Development Authority that should provide the public oversight and leadership in the establishment of goals and objectives and relevant actions steps. Such a focused effort towards economic development merits the possibility of additional staffing resources to carry out the development and implementation of a strategic economic development plan.

Public facilities

The growth and development of the City of Inver Grove Heights adds pressure on government services through increased demands for building permits, community development resources, streets, utilities, stormwater, police and fire protection, park and recreation programming and general administrative responsibilities. Such demands require the City to develop public facilities that house such services. These include administration (City Hall), park and recreation (community center) police, fire and public works. Currently, the bulk of the communities public facilities are sited at the campus on Barbara Avenue. The following improvements are recommended within this plan:

- City Hall--City Hall is currently undergoing remodeling plans, the first major improvement since construction in 1982. This improvement will accommodate growing city administrative services including better meeting facilities needed to better serve a growing population. The improvements are incorporating "green" design or sustainability principles and are projected to be completed by late 2010 or early 2011.
- Police Department--The City Hall is including an addition to the police department facilities which will continue to be housed at the government services campus with fire department administration.
- Fire Department--As new growth occurs in the community, siting of an additional fire station will be needed to serve the Northwest Area and

to enhance service to the rural areas of the community. Future master planning efforts in the Northwest Area should keep this needed public facility investment in mind and should be part of a joint planning effort with land owners/developers seeking future development. Locating a fire station through joint master planning can benefit the development within the Northwest Area by ensuring adequate fire service and benefit the City by seeking an optimal location along future planned arterial roadways.

- Public Works--The public works building is currently over capacity. Additional space is needed to meet existing and future demands. The City is looking to provide additional space for public works.

Action Steps

This implementation plan presents a number of action steps that together have the potential to positively shape growth and change in the City. Since resources are usually limited, it is unrealistic to assume that the City can undertake all of them simultaneously. Therefore, it will be necessary to focus on those that have the greatest potential to accomplish stated goals or those that respond to issues or problems that have been identified within the comprehensive plan.

In order to measure the progress of each action step an implementation matrix has been developed and can be seen in Table 11.4. This tool will allow the City to track each action by its responsible party, associated costs and priority (see sidebar). Essentially, the Action Steps should serve as the "to do list" for the City. As the City and its advisory boards develop annual goals in goal setting workshops, they should consult the to do list as a starting point. As a number of action steps are completed, the plan should be updated to refresh the action steps and, using the community indicators, establish new action steps.

The action steps highlighted in the following table are developed based on the goals and policies identified in the plan and the broader community strategies identified within the Implementation Chapter.

Priority

On-Going: Continuous efforts with no definite start or stop date.

Short-Term: Completing within 1 - 3 years.

Mid-Term: Completing within 3-5 years.

Long-Term: Completing within 5-10 years.

Responsible Party

City – Refers to the City of Inver Grove Heights

County – Refers to Dakota County

Region - This may include regional agencies such as the Metropolitan Council, Minnesota Department of Transportation, Minnesota Department of Natural Resources or Watershed Districts.

Cost

The financial component is indicated by dollar signs:

$-Low Cost: 0 -$20,000

$$ - Medium Cost: $20,000 - $100,000

$$$ - High Cost: +100,000

The intent of the scale is to give a general idea of what it would take to carryout the initiatives from a cost, staffing and resources standpoint.

Table 11.4 Implementation Action Steps

	Implementation Initiative	Description	Responsible Party	Priority	Cost
Land Use	**1** **Review and update zoning and subdivision ordinance.**	*State law requires consistency between a community's zoning ordinance and its comprehensive plan. Ordinances need to be thoroughly reviewed to ensure consistency.*	Planning Commission and City Council	Short Term	$
	2 **Updated Concord Boulevard Corridor Master Plan.**	*In 1998, the City adopted a redevelopment plan for the Concord Neighborhood. The City should update this study as the County continues to construct roadway improvements.*	City Council	Short Term	$ to $$
	3 **Conduct Master Planning for the Northwest Area.**	*Property owner/developer interest in the Northwest Area suggests that the City should begin a master planning effort for the Northwest Area's remaining land areas. This efforts should be collaborative process with property owners and regional agencies (Dakota County and MnDOT). The public purpose is to ensure that near term development is best organized to protect efficiencies of developing long term public improvements: potential interchange with I-494, a north/south transportation corridor, long term transit corridor, a community park facility and future fire station needs.*	City Council in partnership with property owners/ developers and regional agencies	Short Term to Mid Term	$$ to $$$
Economic Development	**4** **Strengthen the role of the Economic Development Authority**	*The City has established an Economic Development Authority; however, to date, the EDA has had limited responsibilities and functions. The City Council should consider strengthening the organizational structure and responsibilities of the EDA.*	City Council	Short Term	$
	5 **Develop an Economic Development Strategic Plan**	*An economic development strategic plan will outline a set of goals, objectives and initiatives for guiding the City in its efforts to enhance the qualify of life and economic stability in the City.*	City Council or EDA	Short Term to Mid term	$
	6 **Develop marketing materials to promote economic development opportunities in IGH.**	*Marketing efforts should be developed to promote the quality life style within Inver Grove Heights that encourage a diverse labor force to live in Inver Grove Heights and the region thus enhancing the attractiveness for business expansion and growth. The marketing efforts should also highlight City owned lands available for economic development.*	City Council or EDA	Short Term to Mid term	$

	Implementation Initiative	Description	Responsible Party	Priority	Cost
Housing					
7	**Prepare a detailed housing action plan.**	*A detailed housing action plan is needed to better understand the critical housing issues facing the community and the most effective means to address them. This effort would include evaluating the merits of inclusionary housing as well as determining other methods and approaches to meeting housing goals including maintenance, diversity and variety.*	City	Short Term	$$
8	**Conduct a critical review of development regulations and processes to reduce barriers.**	*Barriers to developing affordable housing can come in many ways. Setting too restrictive standards for lot size and dimensions or building requirements add costs to housing that pushes it beyond the affordability level. Require multiple layers of approval delay processes adding administrative costs and increasing risks. (See action step 1)*	City	Short Term	$
9	**Conduct an educational campaign to help dispel the myths of affordable housing and recognize the community benefits.**	*A significant barrier to overcome is the opposition to affordable housing. Substantial resources already exist to undertake an education program and can be obtained through partnerships with agencies such as ISAIAH, Dakota County CDA, Metropolitan Council and other housing agencies.*	City, County & Region	Short Term	$
Transportation					
10	**Collaborate with Metro Transit in siting future park and rides in Inver Grove Heights.**	*The regional system plans identify a future park and ride facility in Inver Grove Heights. The City should develop a master plan and design guidelines to clearly communicate a desired form and function, such as Transit Oriented Development for future park and rides in Inver Grove Heights.*	City Council and Metro Transit	Mid Term	$ to $$
11	**Coordinate with Metropolitan Council, MnDOT, Dakota County and other roadway authorities to recognize the need for future interchanges in the NW Area.**	*Planning efforts in the NW Area have identified the need for a future interchange at TH 55/Argenta and I-494. These planning efforts have shown both interchanges will serve as a benefit to the future local and regional transportation system. However, the interchanges are not currently recognized as part of the Transportation Policy Plan. This serves as a significant barrier to implementing the proposed interchanges. To overcome this barrier the City will need to collaborate with local and state agencies to include the interchanges as part of the TPP.*	City	Short Term	$ to $$$

	Implementation Initiative	Description	Responsible Party	Priority	Cost
Transportation	**12**	**Request a functional classification change for:** • **117th Street from Rich Valley Boulevard to TH 52.** • **Rich Valley Boulevard (CSAH 71) between TH 3 and 105th Street (CSAH 73** • **Argenta Trail (CSAH 63) between I-494 and TH 55** • **65th Street between Cahill Avenue and Babcock Trail (CSAH 73).**	*The Transportation Chapter has identified this segment of road to be reclassified. The City will need to work with the Metropolitan Council in order to request a functional classification change.*	City, County & Region	Short Term	$
Parks	**13**	**Work to acquire lands for future parks and the expansion of existing parks**	*The comprehensive plan has identified search areas for future parks and areas that may be candidates for expansion. The City should explore with affected property owners the alternatives for expanding the park system including acquisition and relocation.*	Park Board and City Council	Mid Term to Long Term	$$ to $$$
	14	**Develop Community Indicators List**	*Community indicators, as described earlier in the implementation chapter, can be quite exhaustive. Development of the indicators should follow an inclusive process and should seek to prioritize what measurements are most important to Inver Grove Heights while understanding the relative availability of the data and the level of effort needed to collect the data.*	City Council	Short to Mid Term	$ to $$
	15	**Review and update the City's 2030 Trail Plan**	*The parks and recreation chapter has identified a network of existing and future trail connections. A detailed trails plan is needed to better understand the proposed corridors and the issues facing property owners and the community. This effort would include evaluating alternative alignments and other methods to meet the parks and recreation goals.*	City	Short to Mid Term	$ - $$

Others

	Implementation Initiative	Description	Responsible Party	Priority	Cost
16	**Prepare needs assessment for public works expansion.**	*Based on projected growth and development, evaluate the existing facilities and growth needs of current public works facilities.*	City Council	Mid Term	$ to $$
17	**Prepare needs assessment for fire station facilities.**	*Evaluate the need for additional fire station facilities based on future growth plans and changing demographics.*	City Council	Mid Term	$ to $$

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Appendix

General Summary of Demographic Data based on 2000 Census

Population

1990	22,477
2000	29,751
% increase	32%

population increased from 22,477 in 1990 to 29,751 in 2000, a 32% increase.

Median age

Inver Grove Heights	33.8	0
Dakota County	33.7	
Twin Cities SMSA	34.2	

The 2000 median age of Inver Grove Heights's population was 33.8 years. This compares with 33.7 years for the County and 34.2 years for the region.

Gender

In 2000, women made up 50% of Inver Grove Heights's population.

Residence in 1995

	Same house	Outside of county
Inver Grove Heights	52%	26%
Dakota County	54%	26%
Twin Cities SMSA	54%	25%

In the 2000 Census, only 52% of the population (age 5 and older) lived in the same house in 1995 (see Figure 4). This compares with 54% for all of Dakota County and 54% for the region.
26% of Inver Grove Heights's 2000 population lived outside of Dakota County in 1995.
People moving to Inver Grove Heights from a different house in Dakota County made up 22% of the 2000 population.
This portion of the population is significantly higher than the comparable segments of the County (26%) and regional (25%) populations.

Year moved in

	1990 or later
Inver Grove Heights	71%
Dakota County	71%
Twin Cities SMSA	67%

71% of Inver Grove Heights's 2000 population moved into their current house in 1990 or later.

Households

	Family households	Married couple	Children <18	Nonfamily	Alone
Inver Grove Heights	70%	56%	37%	30%	73%
Dakota County	72%	59%	40%	28%	
Twin Cities SMSA	65%	52%	34%	35%	

70% of Inver Grove Heights households are family households (see Figure 7). This compares with 72% for the entire County and 65% for the region.
56% of all Inver Grove Heights family households include a married couple.
37% of all households included children under the age of 18 (see Figure 8). Only 34% of all households in the region contained children.

Inver Grove Heights has a smaller proportion of nonfamily household than the region as a whole (30% to 35%).

Household size

	2000	1990	Own	Rent
Inver Grove Heights	2.62	2.85	2.72	2.27
Dakota County	2.70			
Twin Cities SMSA	2.56			

From 1990 to 2000, the average size of all Inver Grove Heights households dropped from 2.85 people to 2.62 people (see Figure 9).
More people live in the average household for owned housing (2.72 people per household) than in rental housing (2.27 people).

Race

% White	1990	2000
Inver Grove Heights	97%	92%
Dakota County		91%
Twin Cities SMSA		86%

In 1990, 97.1% of the population was white. The 2000 Census reported that 91.8% of Inver Grove Heights's population identified itself as white.
In the 2000 Census, 1256 people were reported as Hispanic or Latino (of any race). This represents 4% of the total population.

Only 4.4% of dakota's 2000 population was foreign born.

Poverty

In 2000, 11.3% of all families reported incomes below the poverty level.
15.6% of all individuals had poverty level incomes in 2000.

Educational attainment

Attended college	1990	2000	Not HS grad	Degree (BA/grad)
Inver Grove Heights	51%	63%	8.0%	30%
Dakota County		70%		35%
Twin Cities SMSA		65%		33%

In 2000, 63.5% of the population (age 25 and older) had attended college. This share of the population is up from 51.3% in the 1990 Census (see Figure 22).
Less than 8% of the 2000 population did not graduate from high school.
30% of Inver Grove Heights's population had earned a degree as compared with 35% for the County and 33% for the region.

Employment

In labor force	1990	2000
Inver Grove Heights	76%	76%
Dakota County		76%
Twin Cities SMSA		72%

The share of the working age population in the labor force grew from 76.1% to 76.2%.

Unemployed	1990	2000
Inver Grove Heights	4%	2%
Dakota County		2%
Twin Cities SMSA		3%

The percent reported as unemployed fell from 3.6% in 1990 to 2.0% in 2000.

Not in labor force	1990	2000
Inver Grove Heights	20%	22%
Dakota County		22%
Twin Cities SMSA		26%

The change in the labor force comes from a smaller portion of the population reporting itself as not in the labor force (20.1% in 1990 to 21.7% in 2000).

Commuting

	1990	2000
Drove alone	81%	85%
Public	2.1%	2.2%
Walk/Home	2.9%	3.0%

The percent of Inver Grove Heights workers driving alone to work increased from 1990 (81.3%) to 2000 (85.1%).
The labor force in Inver Grove Heights makes limited use of public transportation (2.1% in 1990 and 2.2% in 2000).
The share of workers that walked or worked at home increased from 2.9% to 3.0% from 1990 to 2000.

Jobs

In the 2000 Census, 16,780 Inver Grove Heights residents were employed in the civilian labor force. Inver Grove Heights was the place of employment for 8,244 people.

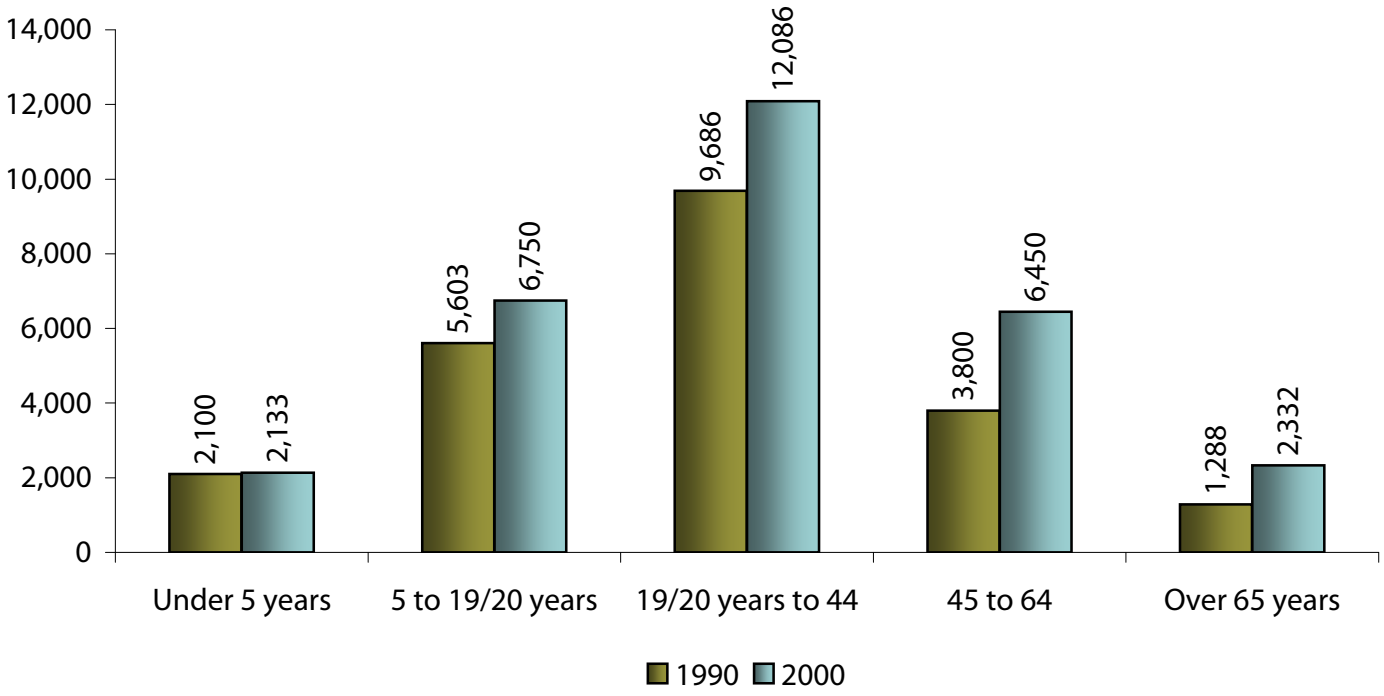
Sum of major employers	3,924
% of people working in Inver Grove Heigh	48%

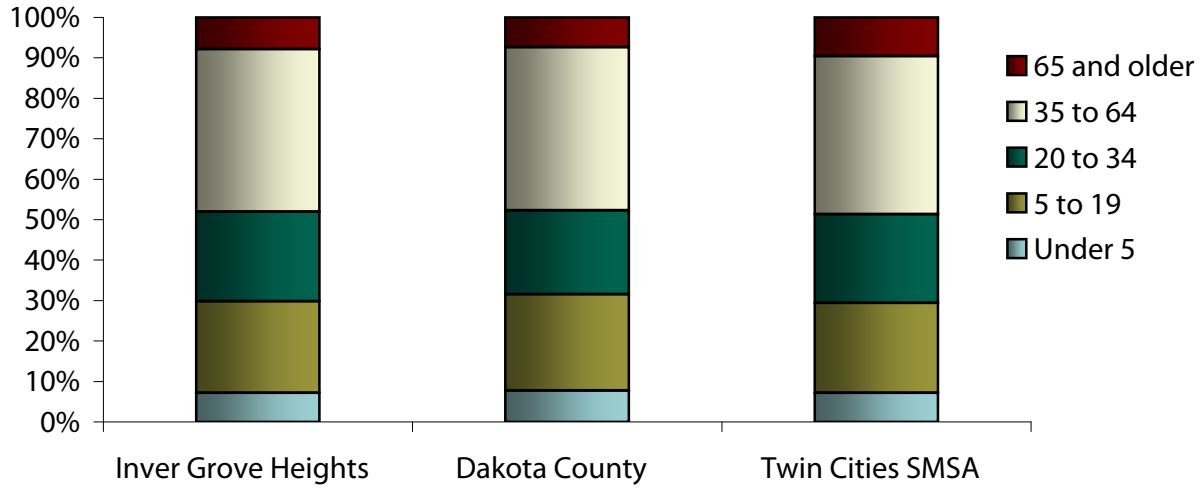
These employers account for 3,924 jobs. These jobs represent 47.6% of the people that reported jobs in Inver Grove Heights as part of the 2000 Census.

Housing

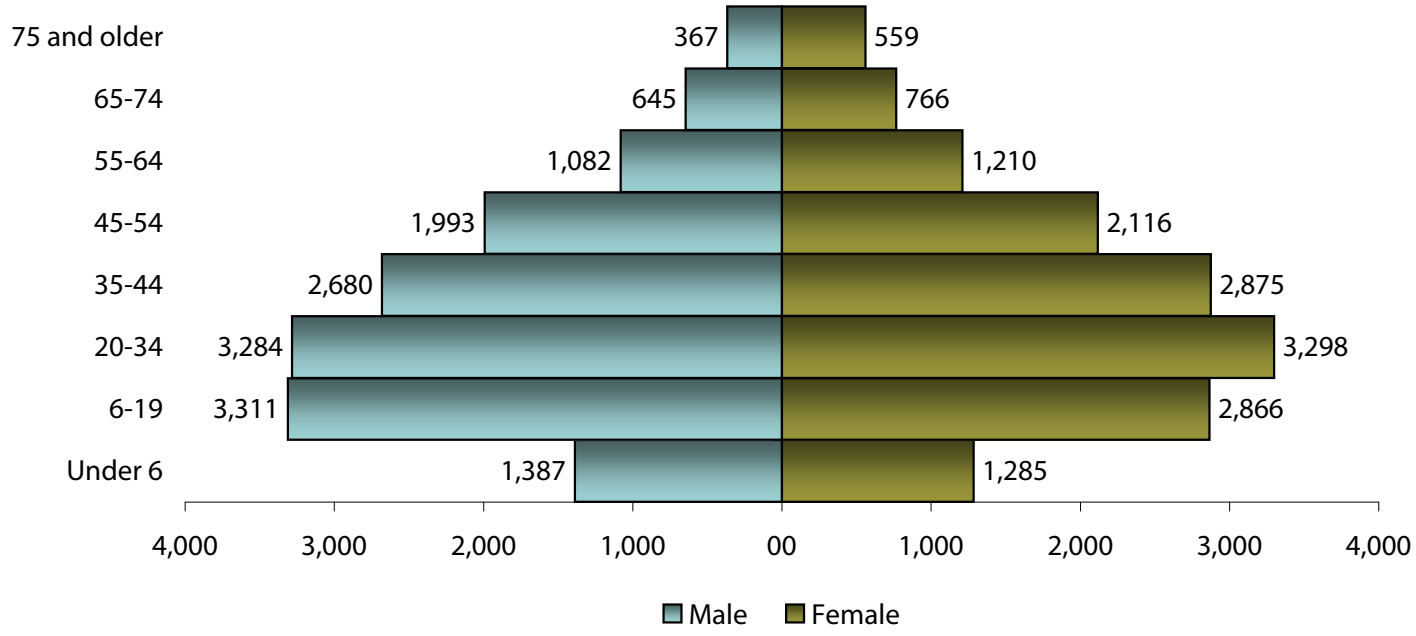
The Census reported 3,303 new housing units in Dakota County over this decade, a 40.5% increase in the total number of units.
Single family detached housing (1-unit detached) accounted for 51% of this growth.
An additional 30% of the growth came in the form of single family attached housing (1-unit attached).
In 2000, single family housing (detached and attached) made up 70% of dakota's housing stock).
22% of the 2000 housing supply was classified as rental (see Figure 38).
Only 152 units (2.5%) of all 1-unit detached housing were rental.
Only 488 units (18.4% of all units with 2 or more units in a structure) were classified as owner occupied.
63% of the 2000 population lived in single family detached housing (see Figure 40).
14% of the population lived in rental housing with five or more units in the building.
35% of the 2000 housing supply was built in 1990 or later (see Figure 40)
23% of all units were built before 1970.
24% of all rental units were built in 1990 or later.
A householder age 44 or younger occupied 54% of all owned housing built in 1990 or later.
86% of senior households (householder age 65 and older) lived in owned housing.
The majority of rental units (75%) are occupied by households headed by persons age 44 or younger.

Age

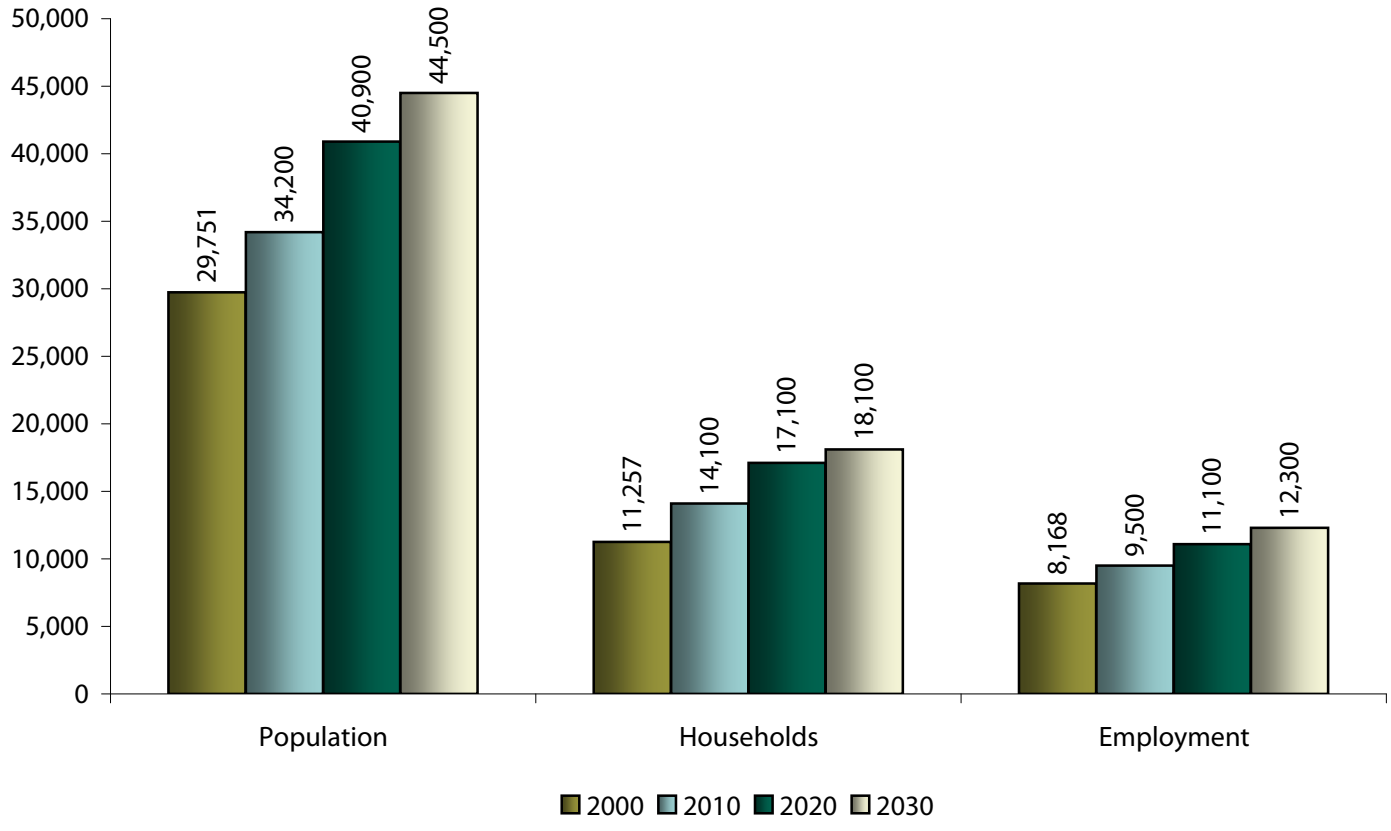

14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2,100
2,133
5,603
6,750
9,686
12,086
3,800
6,450
1,288
2,332
Under 5 years
5 to 19/20 years
19/20 years to 44
45 to 64
Over 65 years
1990
2000

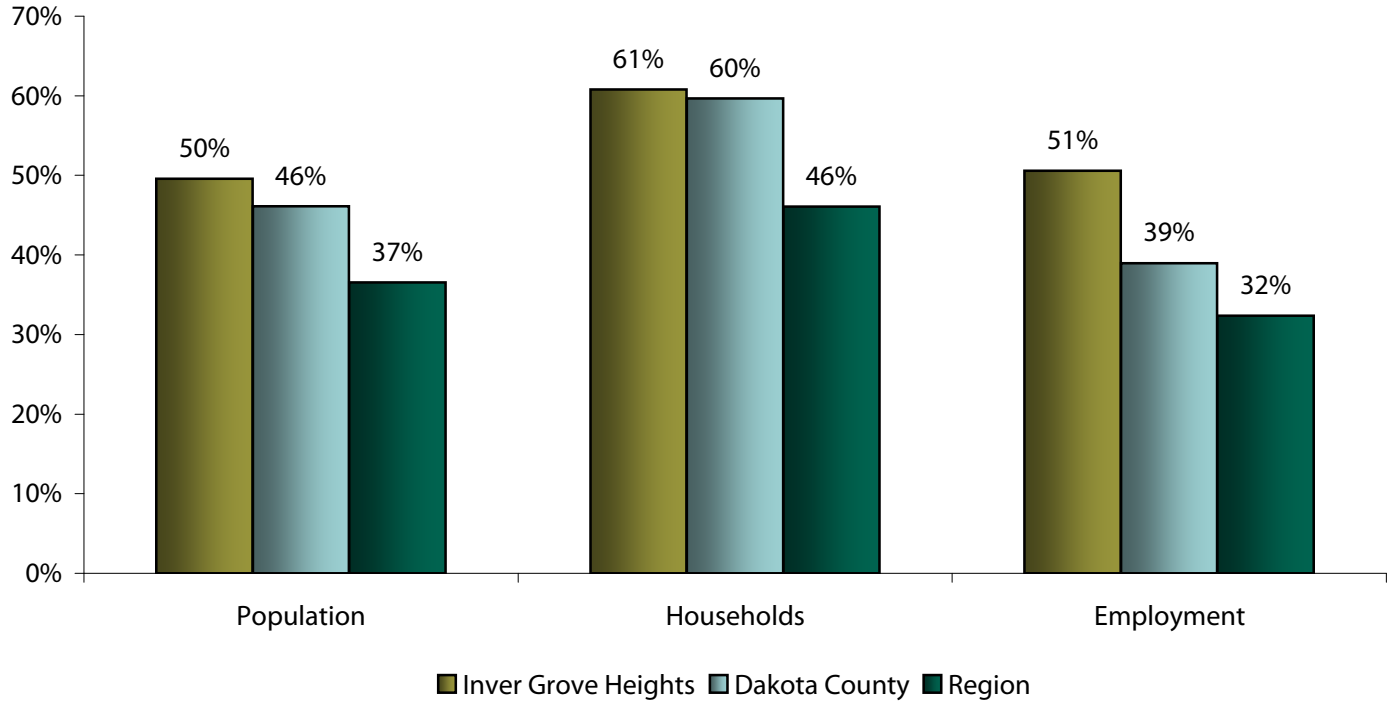

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
65 and older
35 to 64
20 to 34
5 to 19
Under 5
Inver Grove Heights
Dakota County
Twin Cities SMSA

Age Distribution

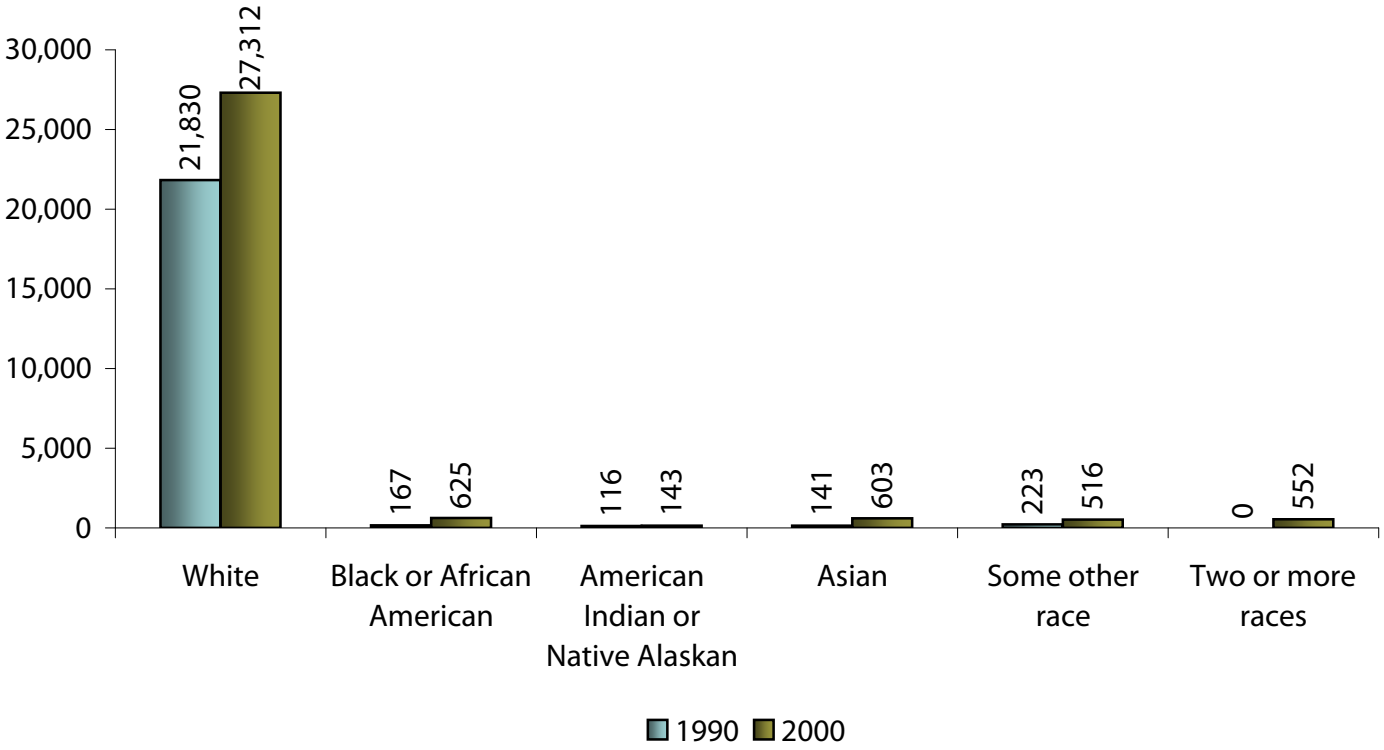


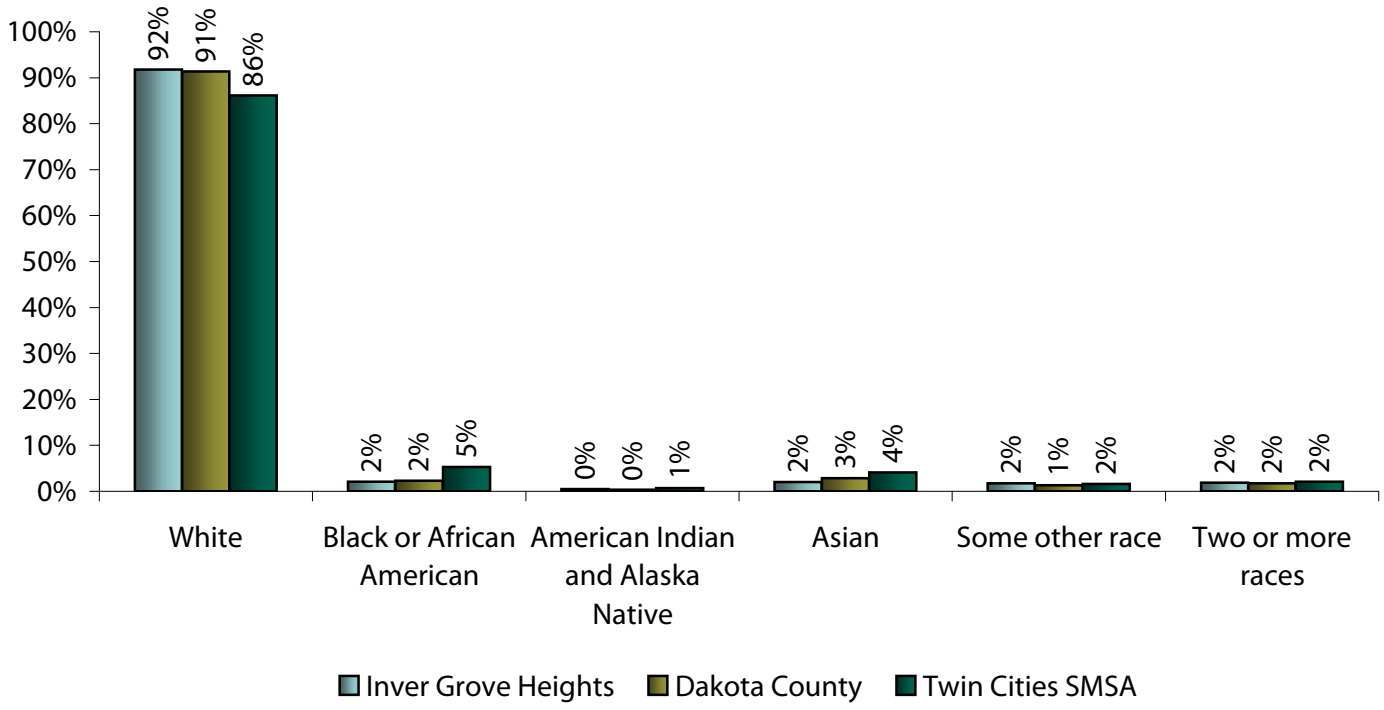
Metropolitan Council Forecasts



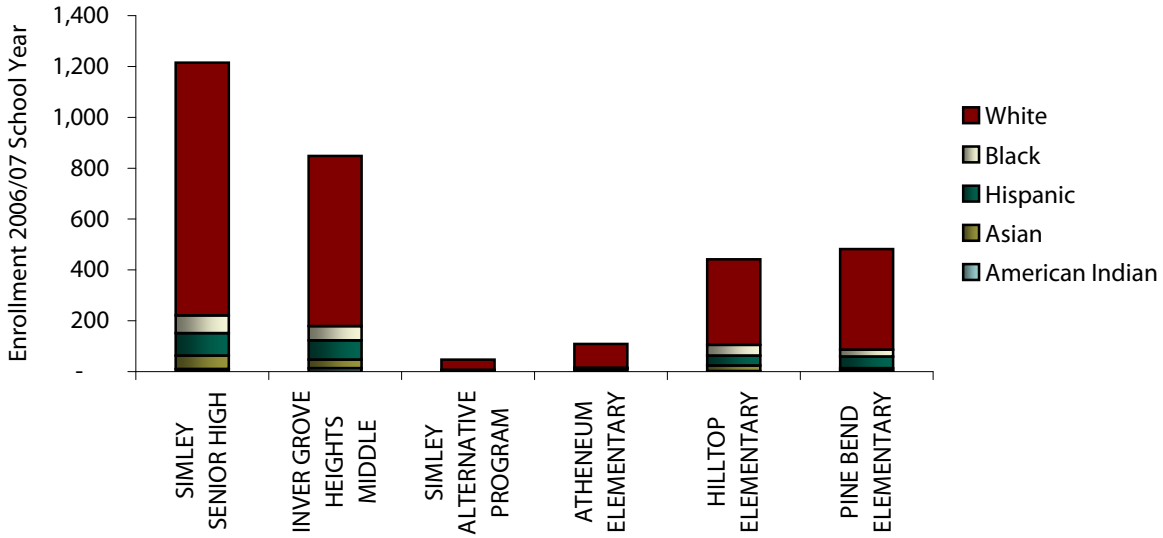


Race

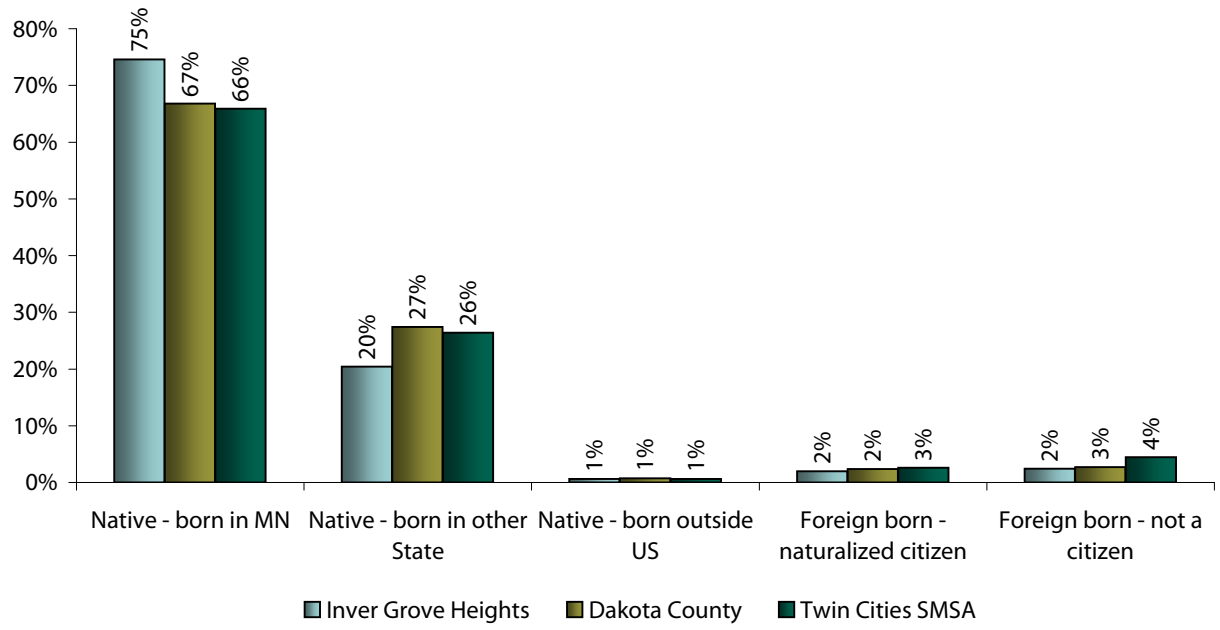

30,000
25,000
20,000
15,000
10,000
5,000
0
21,830
27,312
167
625
116
143
141
603
223
516
0
552
White
Black or African American
American Indian or Native Alaskan
Asian
Some other race
Two or more races
1990
2000

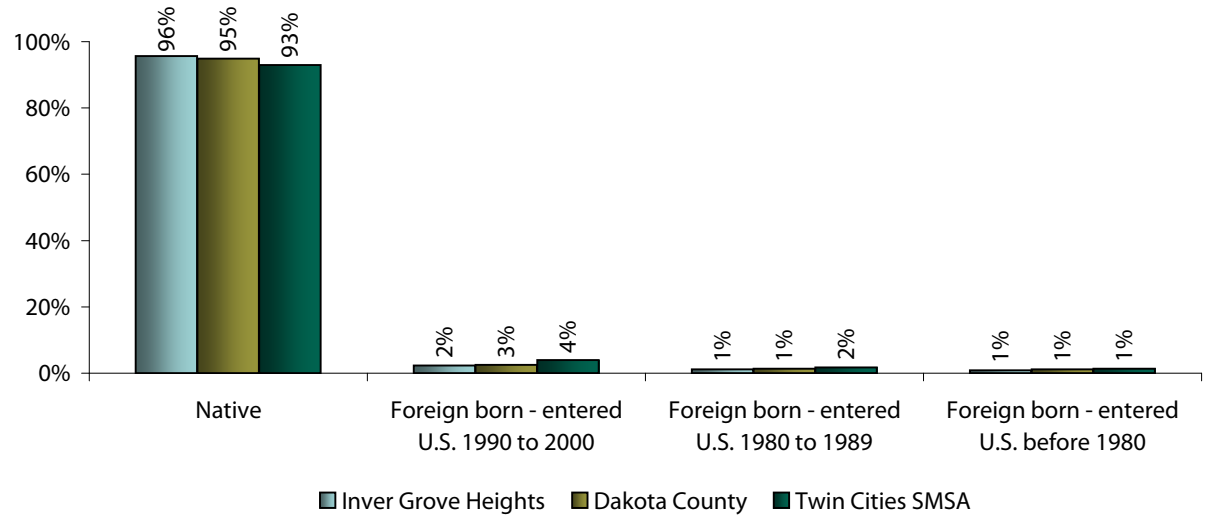

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
92%
91%
86%
2%
2%
5%
0%
0%
1%
2%
3%
4%
2%
1%
2%
2%
2%
2%
White
Black or African American
American Indian and Alaska Native
Asian
Some other race
Two or more races
Inver Grove Heights
Dakota County
Twin Cities SMSA

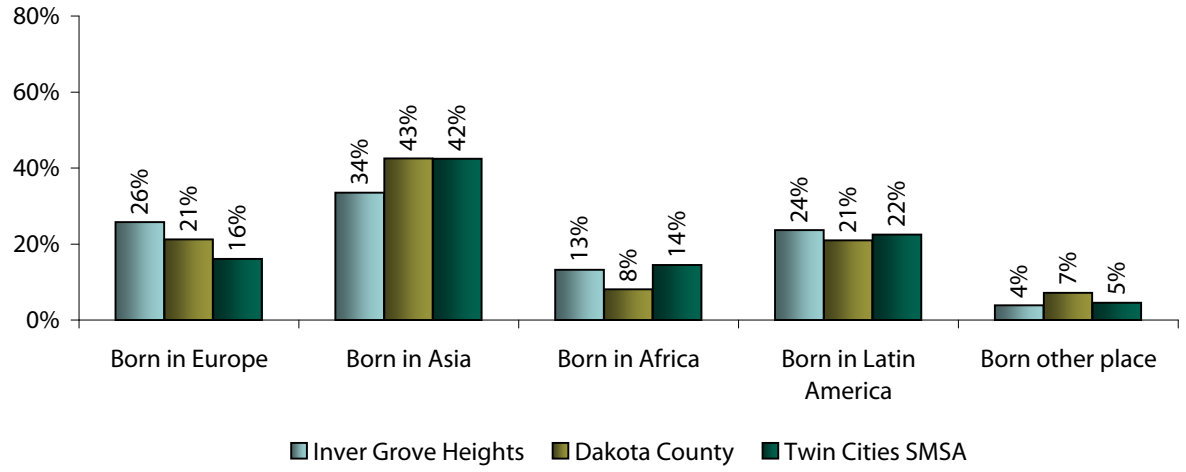
School Race


Enrollment 2006/07 School Year
1,400
1,200
1,000
800
600
400
200
-
SIMLEY SENIOR HIGH
INVER GROVE HEIGHTS MIDDLE
SIMLEY ALTERNATIVE PROGRAM
ATHENEUM ELEMENTARY
HILLTOP ELEMENTARY
PINE BEND ELEMENTARY
White
Black
Hispanic
Asian
American Indian

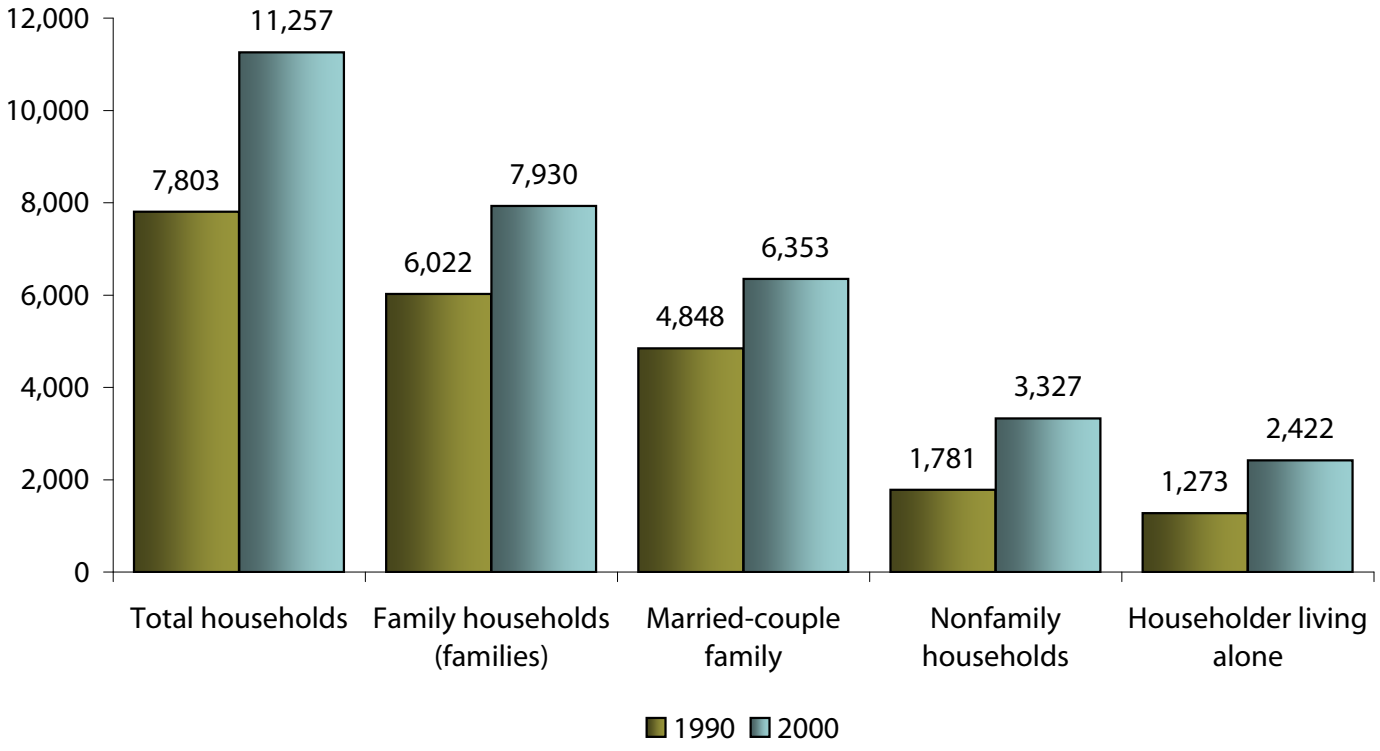
Place of Birth

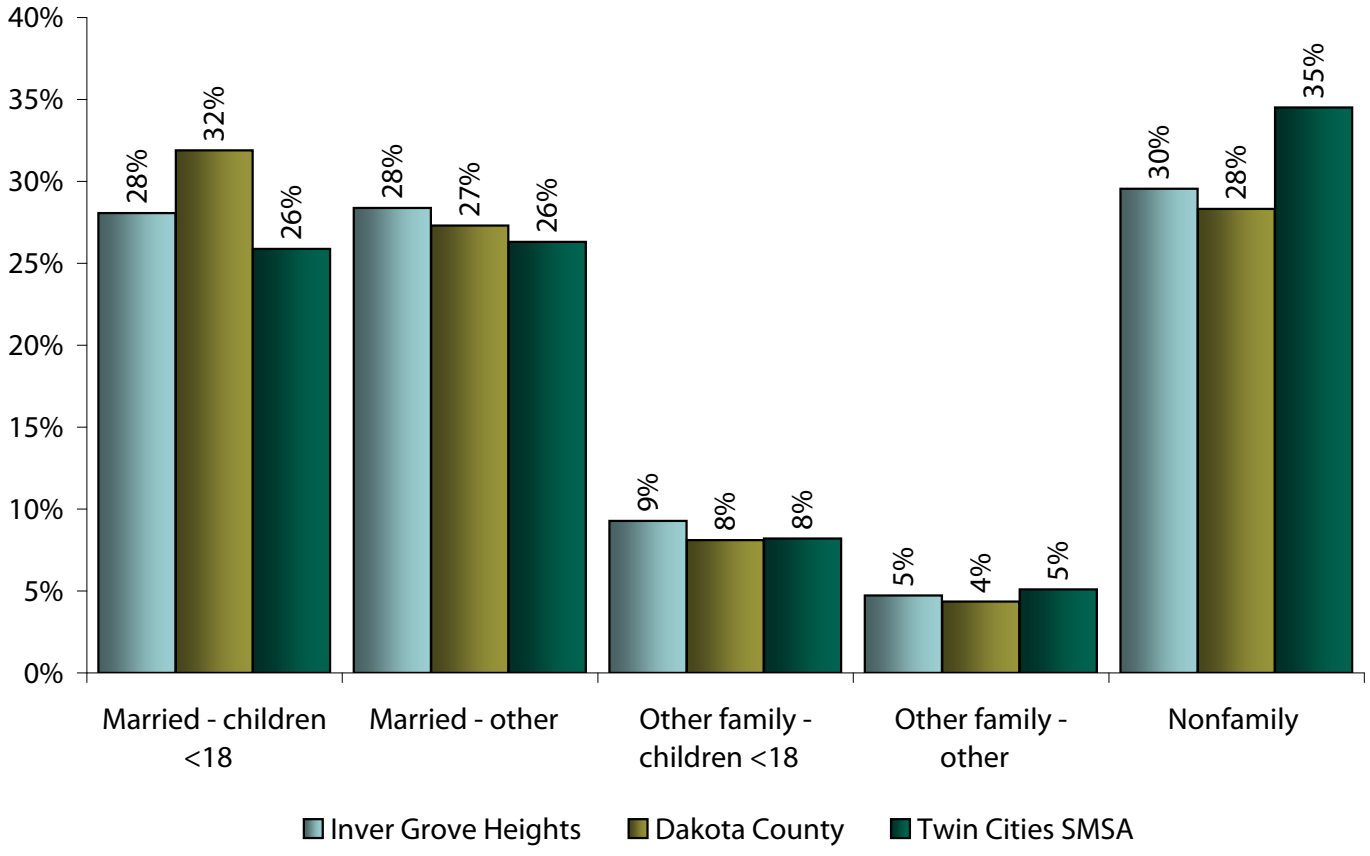




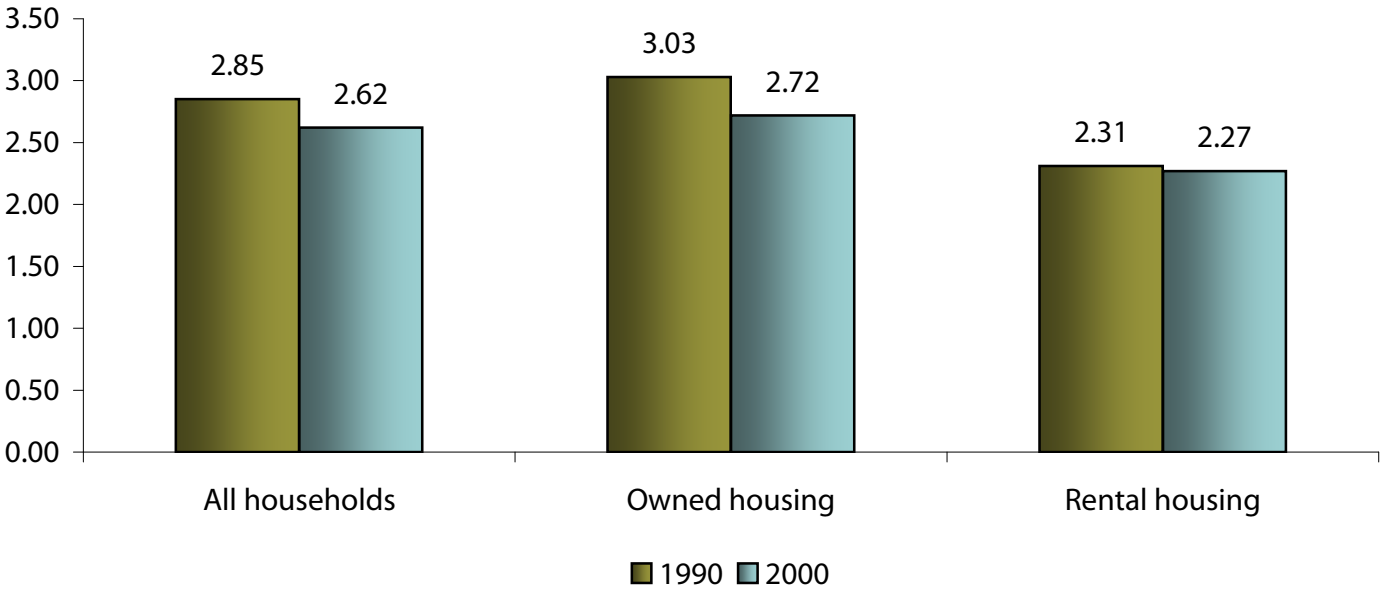


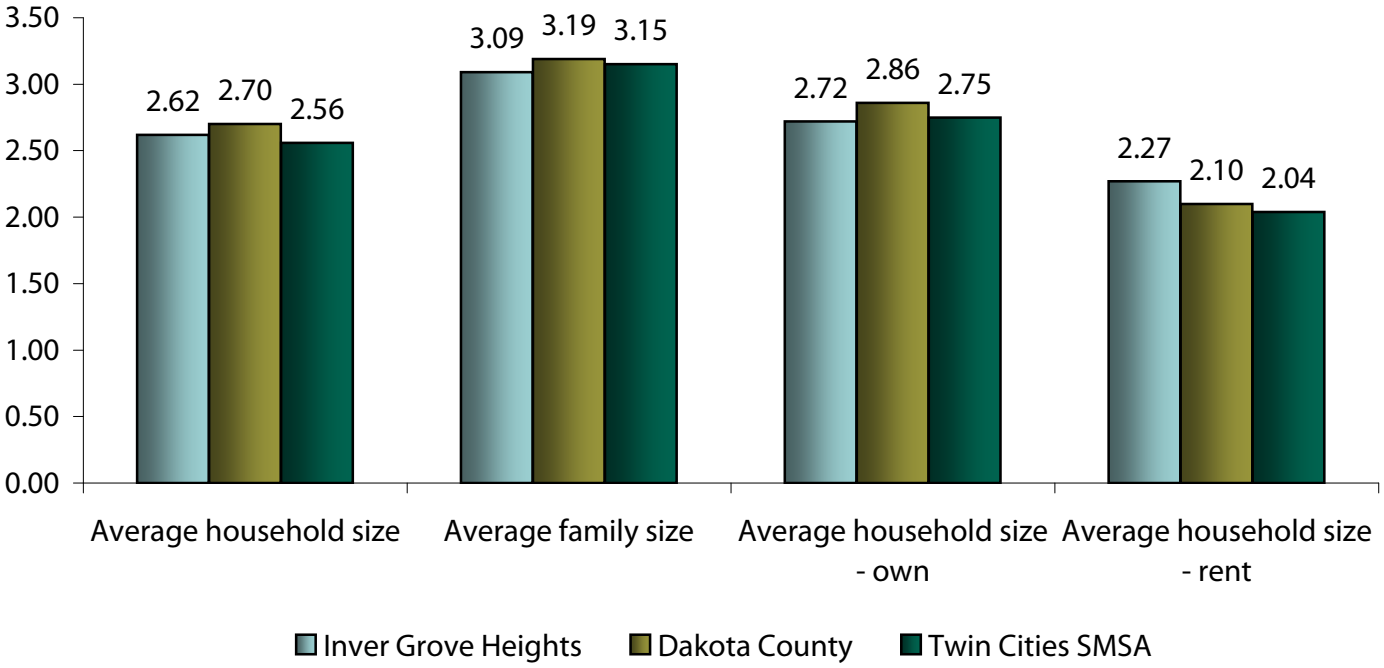
Households


12,000
10,000
8,000
6,000
4,000
2,000
0
7,803
11,257
6,022
7,930
4,848
6,353
1,781
3,327
1,273
2,422
Total households
Family households (families)
Married-couple family
Nonfamily households
Householder living alone
1990
2000

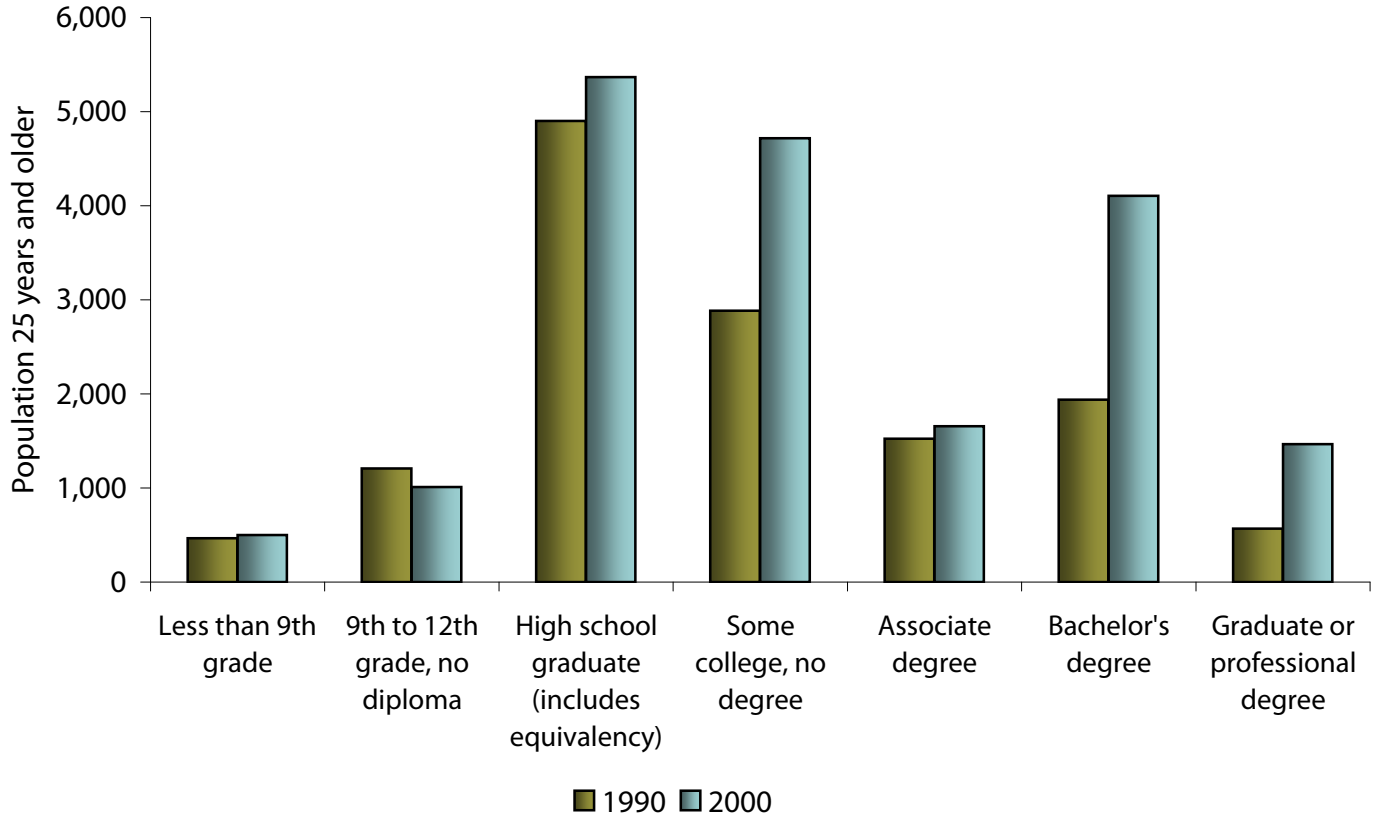

40%
35%
30%
25%
20%
15%
10%
5%
0%
28%
32%
26%
28%
27%
26%
9%
8%
8%
5%
4%
5%
30%
28%
35%
Married - children <18
Married - other
Other family - children <18
Other family - other
Nonfamily
Inver Grove Heights
Dakota County
Twin Cities SMSA

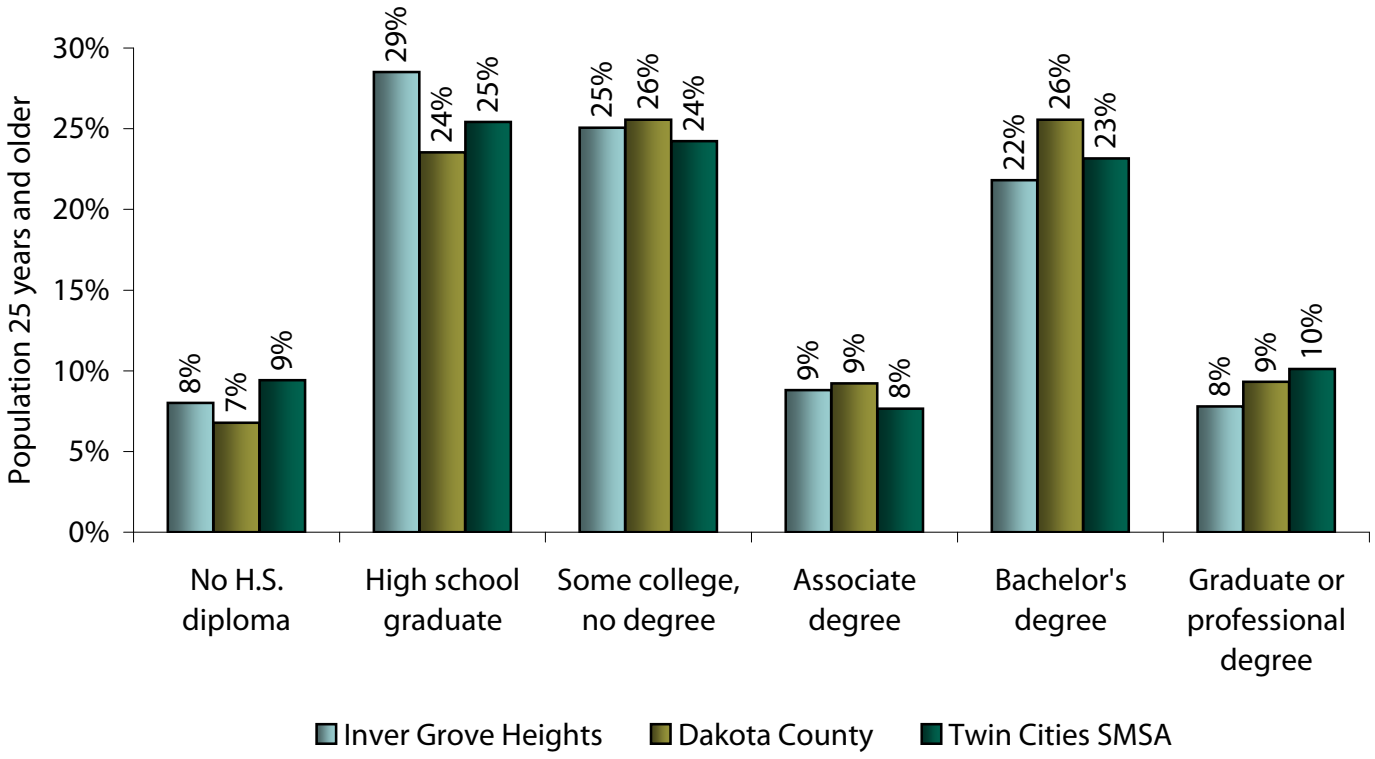
Household Size



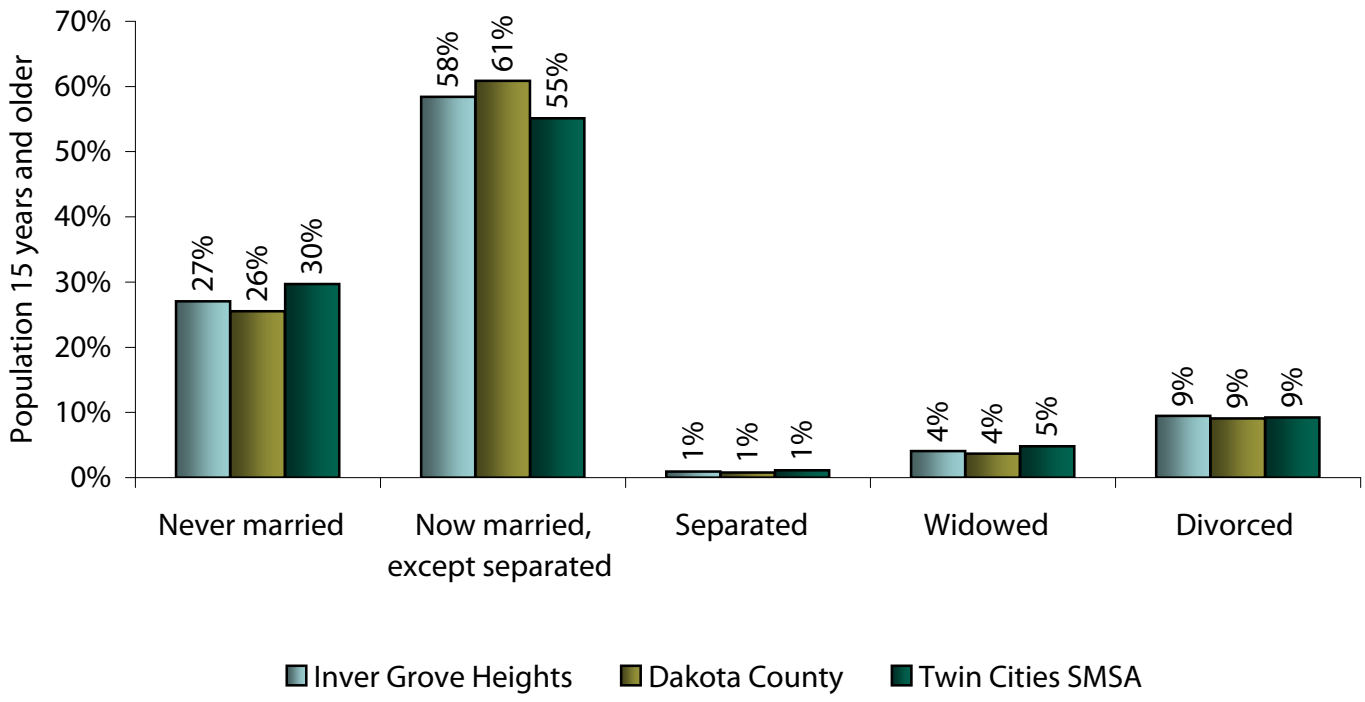


Educational Attainment

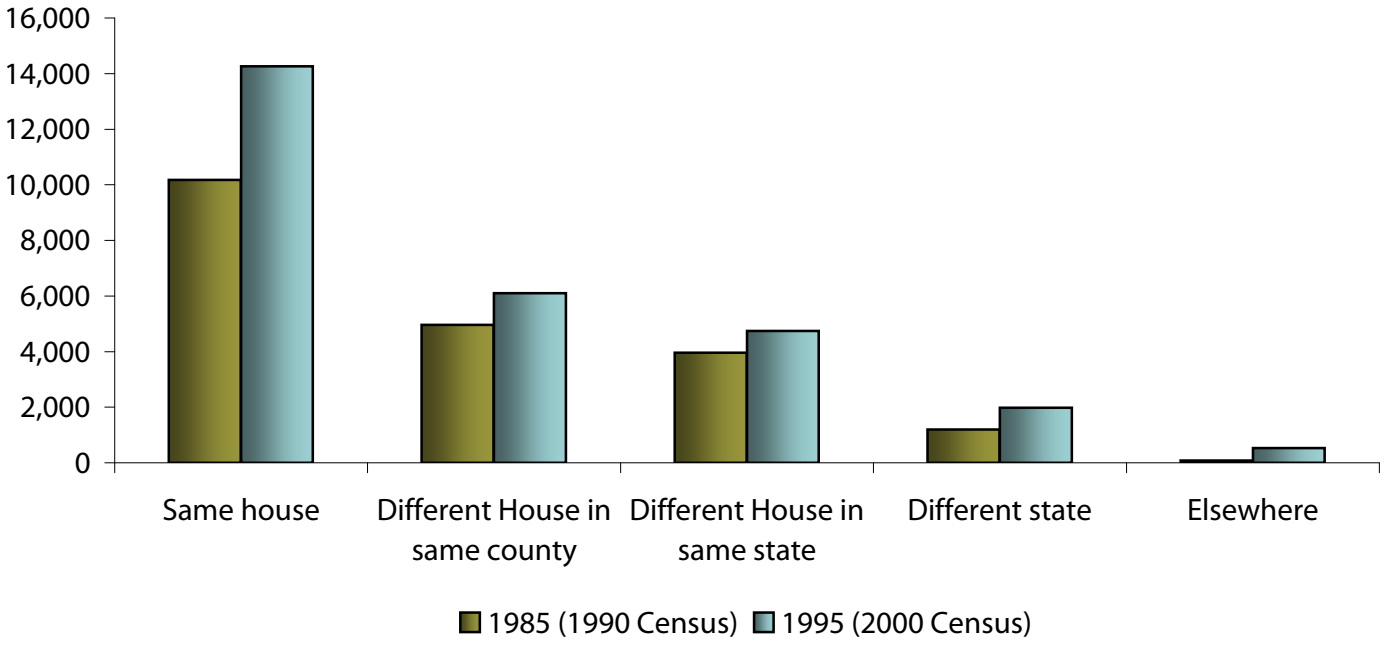


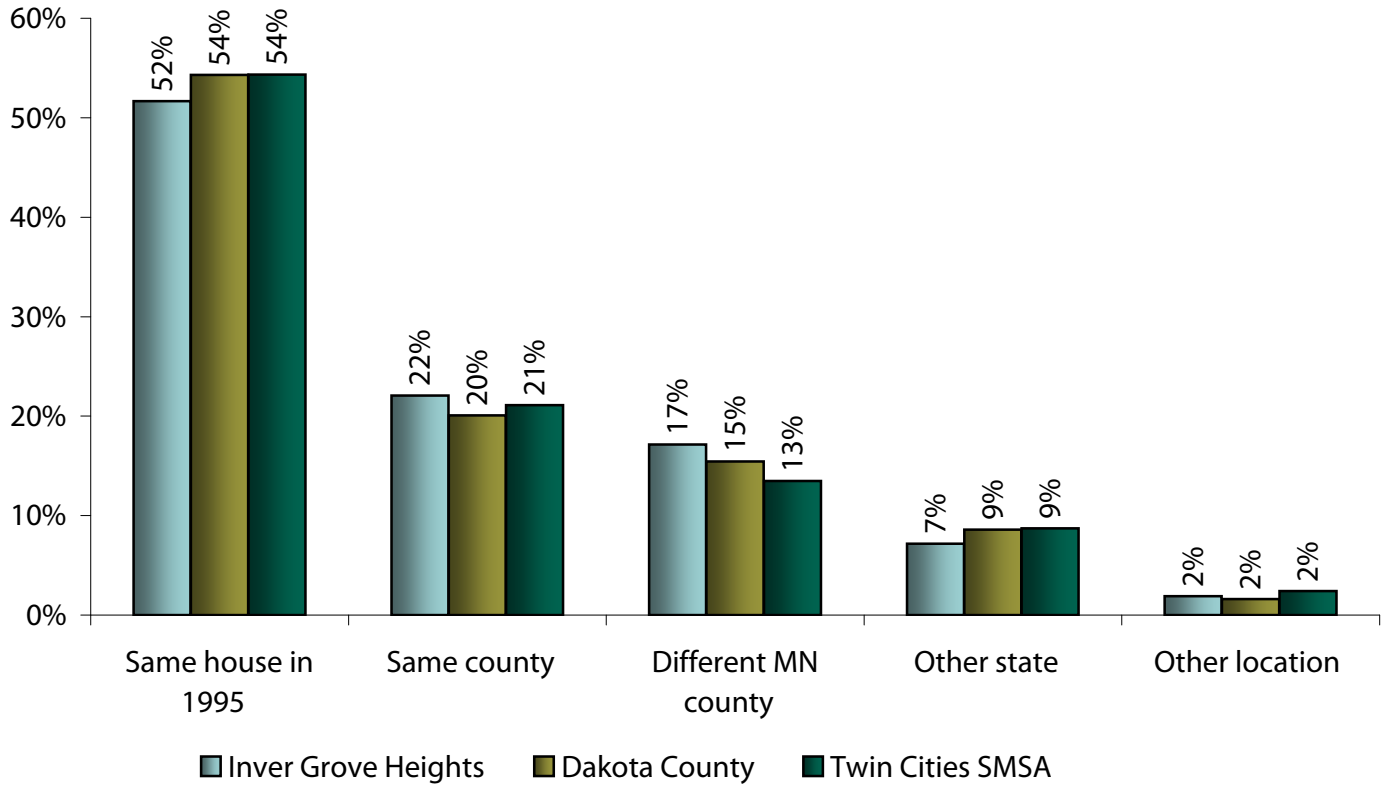


Marital Status

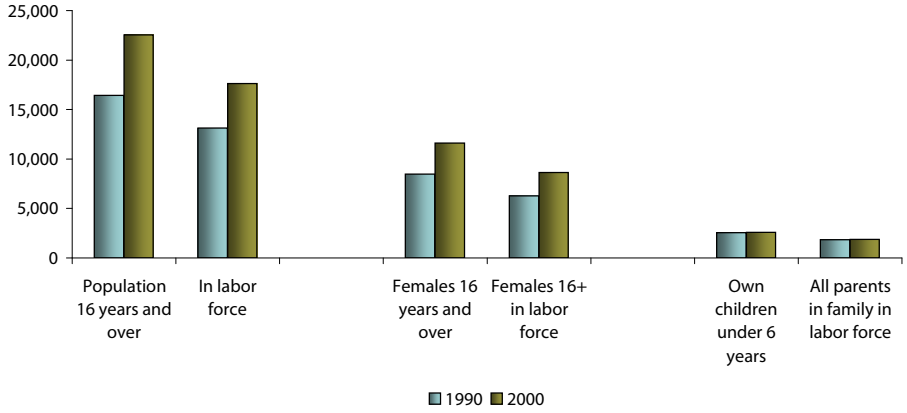


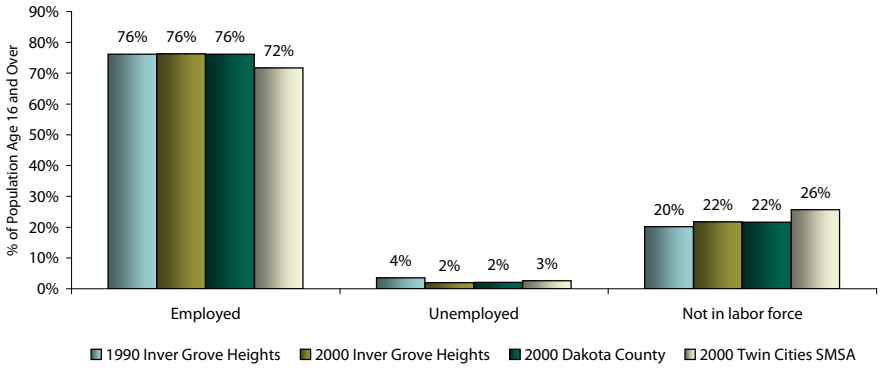
Residence Five Years Earlier

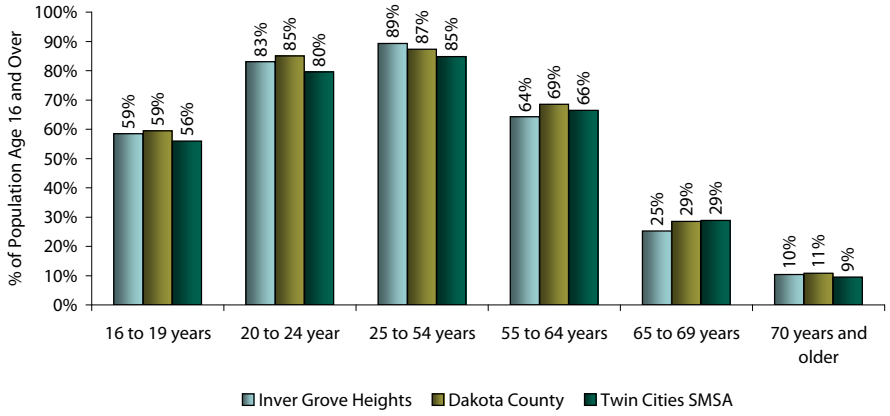


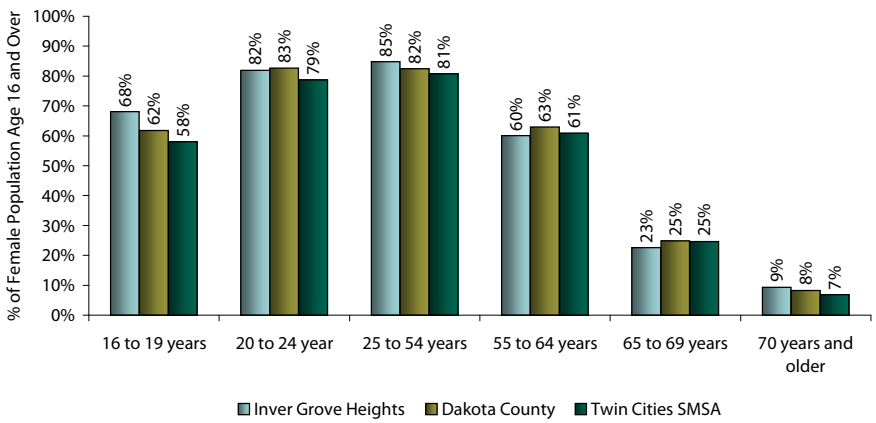


Employment Status

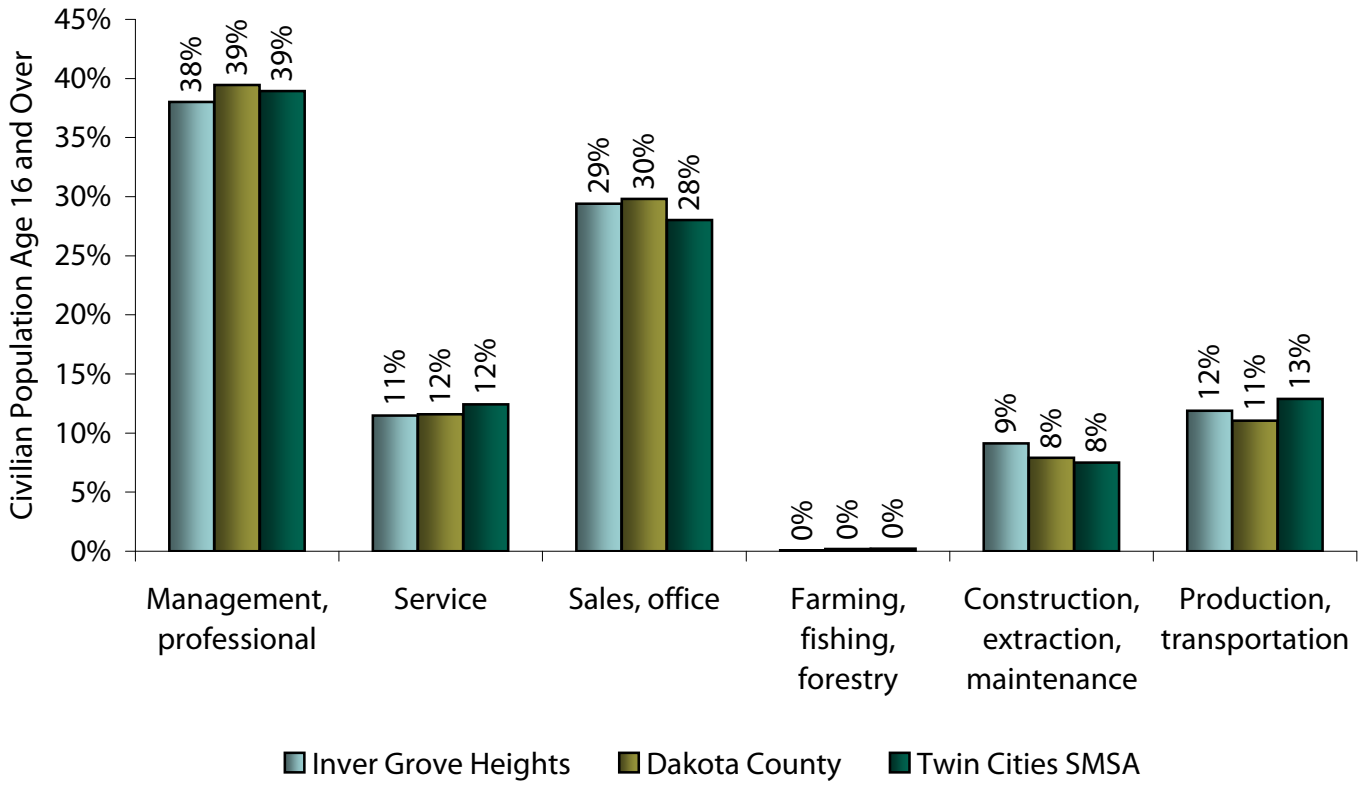








Occupation

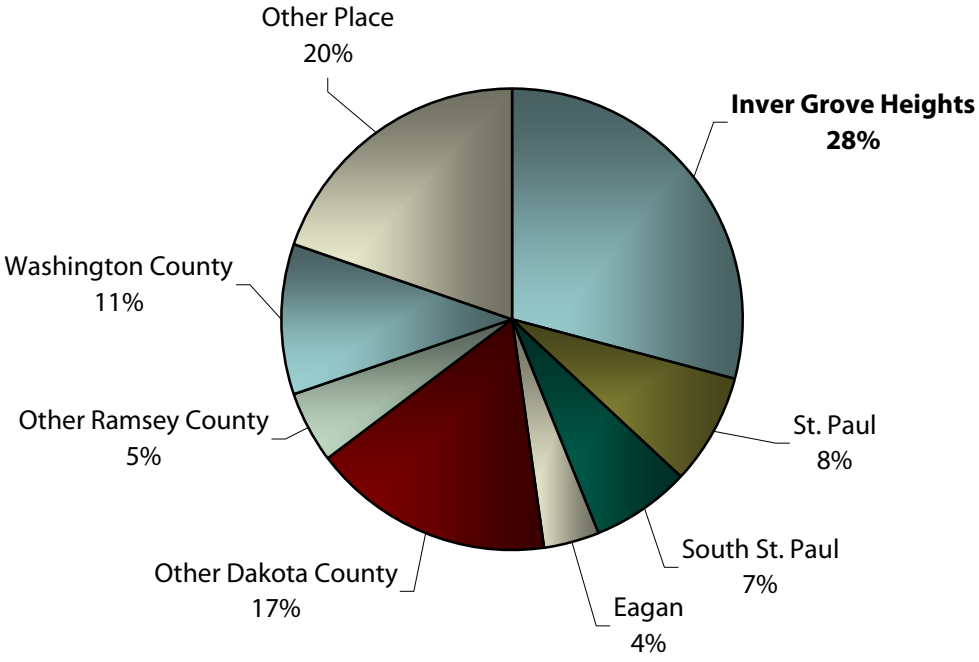

Civilian Population Age 16 and Over
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
38%
39%
39%
11%
12%
12%
29%
30%
28%
0%
0%
0%
9%
8%
8%
12%
11%
13%
Management, professional
Service
Sales, office
Farming, fishing, forestry
Construction, extraction, maintenance
Production, transportation
Inver Grove Heights
Dakota County
Twin Cities SMSA

Major Employers

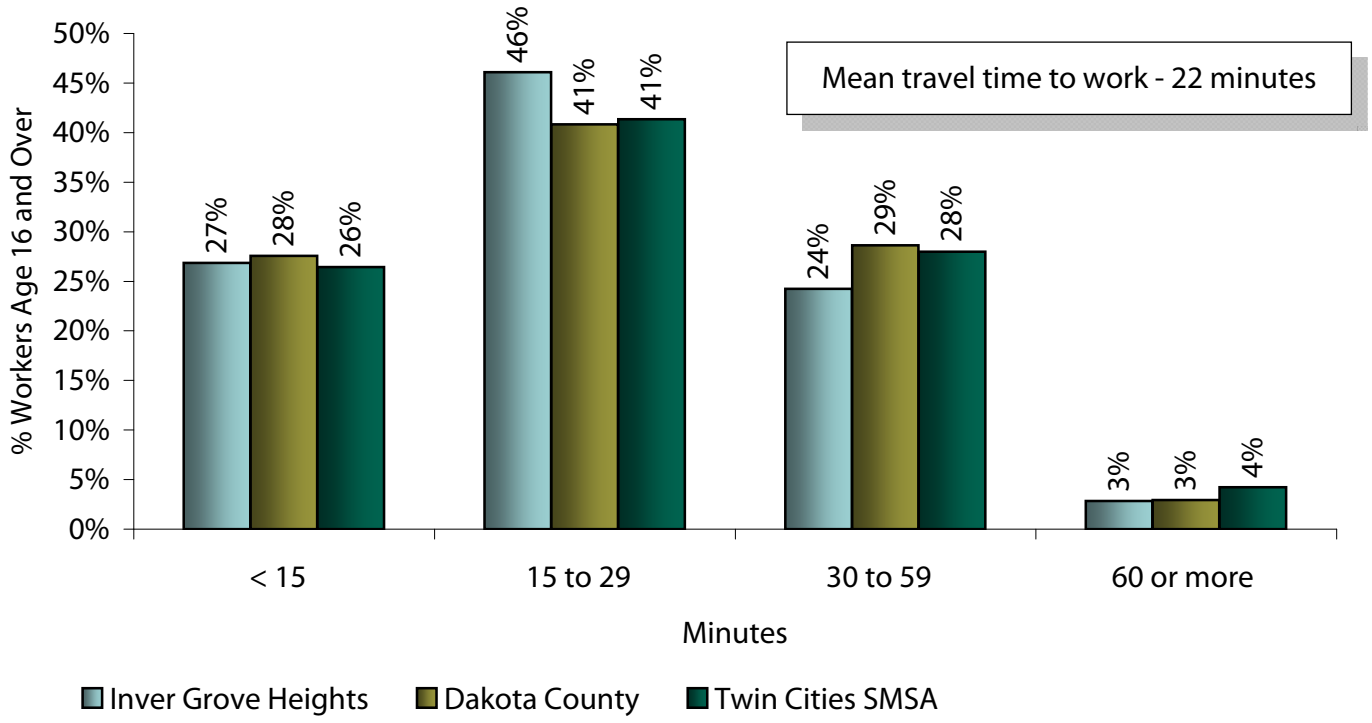
Employer	Products/Services	Employee Count
S Cooperatives	Pesticide & Other Agricultural Chemical Mfg.	1,000
Inver Grove Hts School District #199	Elementary & Secondary Schools	525
Travel Tags	Comm. Flexographic Printing	430
Inver Hills Community College	Colleges, Universities, & Prof. Schools	425
Evergreen Industries	Nursery & Tree Prod.	300
Walmart	Warehouse Clubs & Supercenters	270
BFI Waste Services	Solid Waste Collection	140
Southview Chevrolet	New Car Dealers	135
Lofton Label Inc	Laminated Plastics Plate, Sheet (exc. Packaging), & Shape Mf	133
Inver Grove Heights, City of	Executive & Legislative Offices, Combined	130
Inver Grove Ford	New Car Dealers	100
Applebee's Neighborhood Grill	Full-Service Restaurants	90
Kerasotes Theater	Motion Picture Theaters (exc. Drive-Ins)	90
Outback Steakhouse	Full-Service Restaurants	81
Damon's of Minnesota	Full-Service Restaurants	75

Source: Minnesota Department of Employment and Economic Development

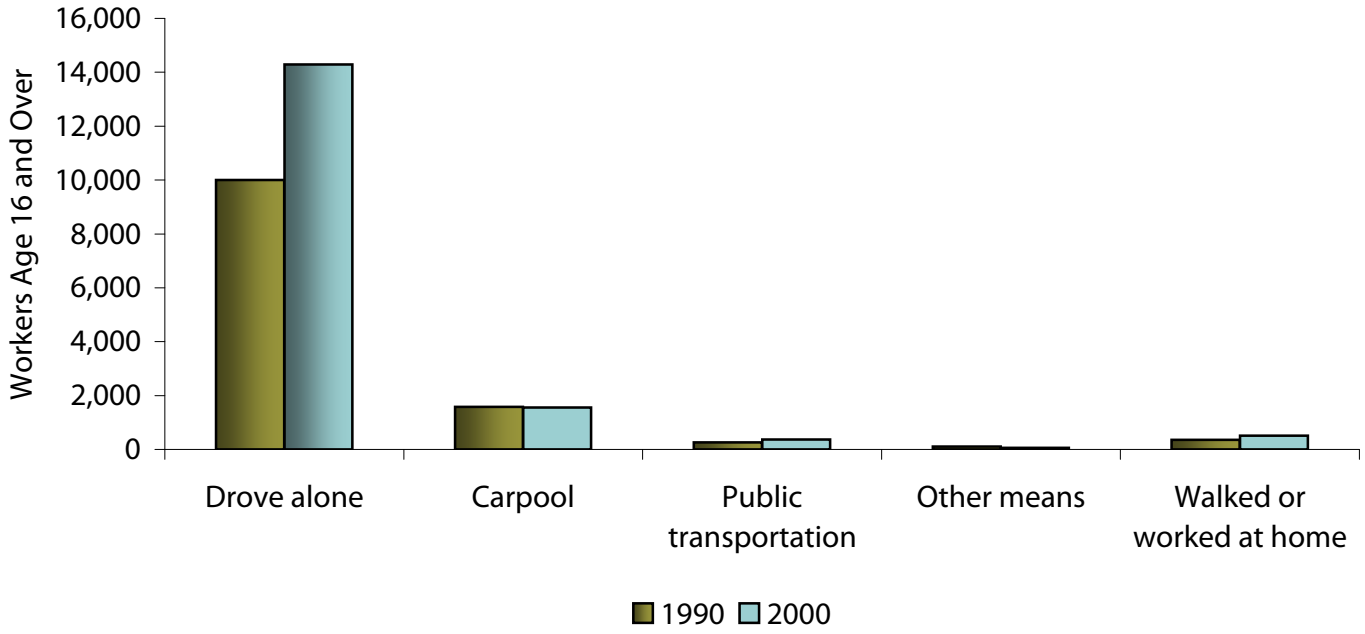
Residence of People Working in Inver Grove Heights

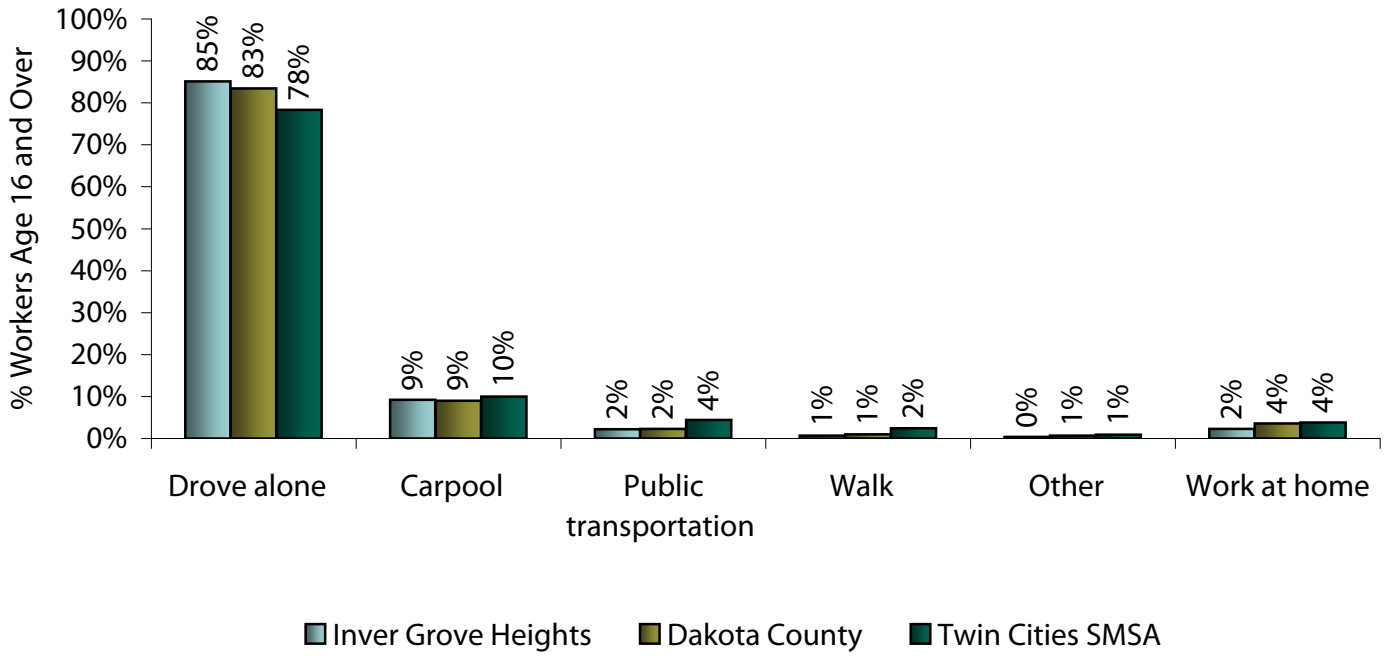


Travel Time to Work

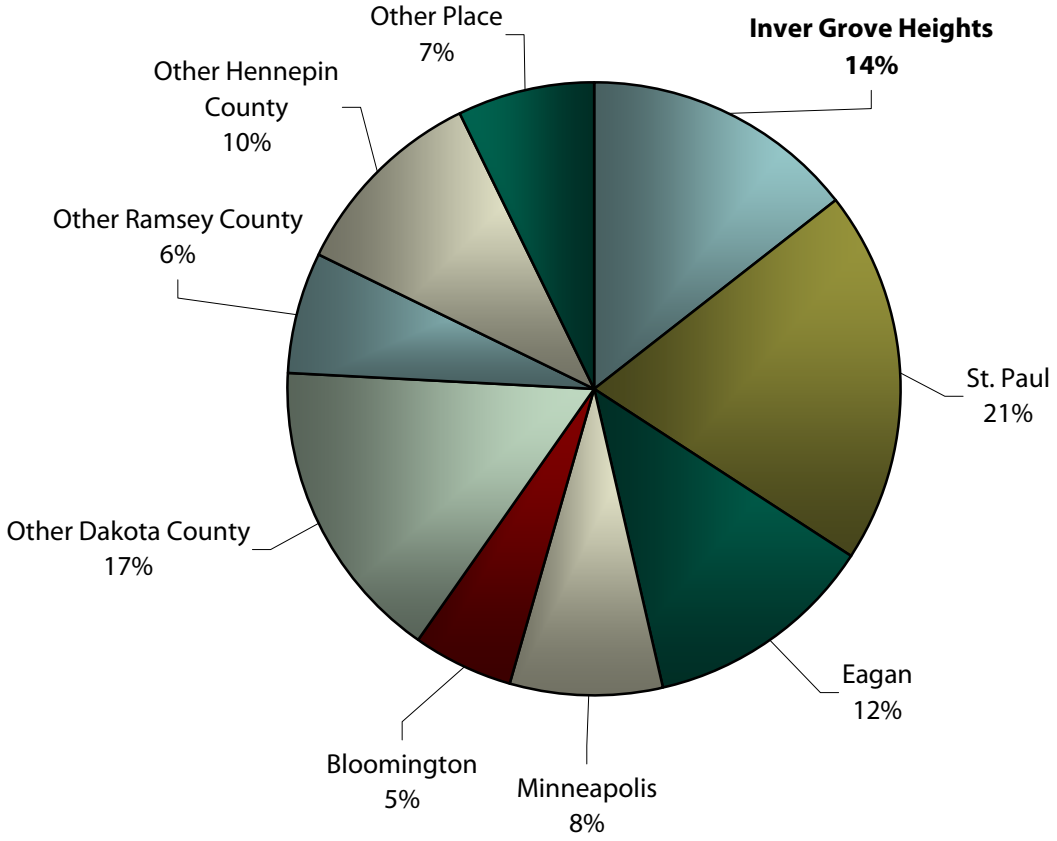


Commuting to Work

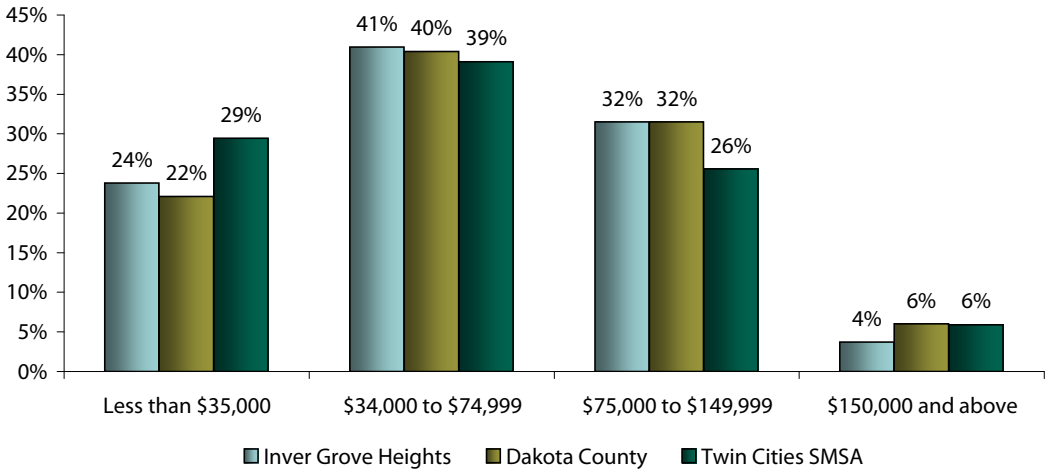


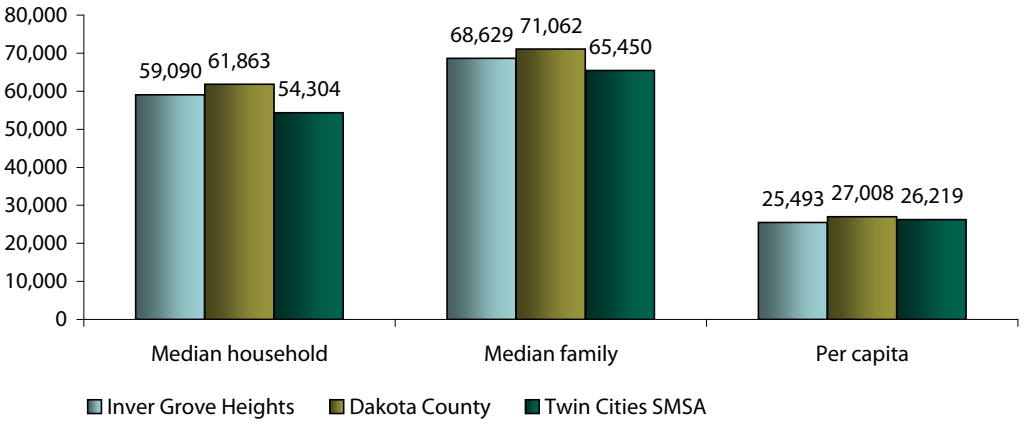


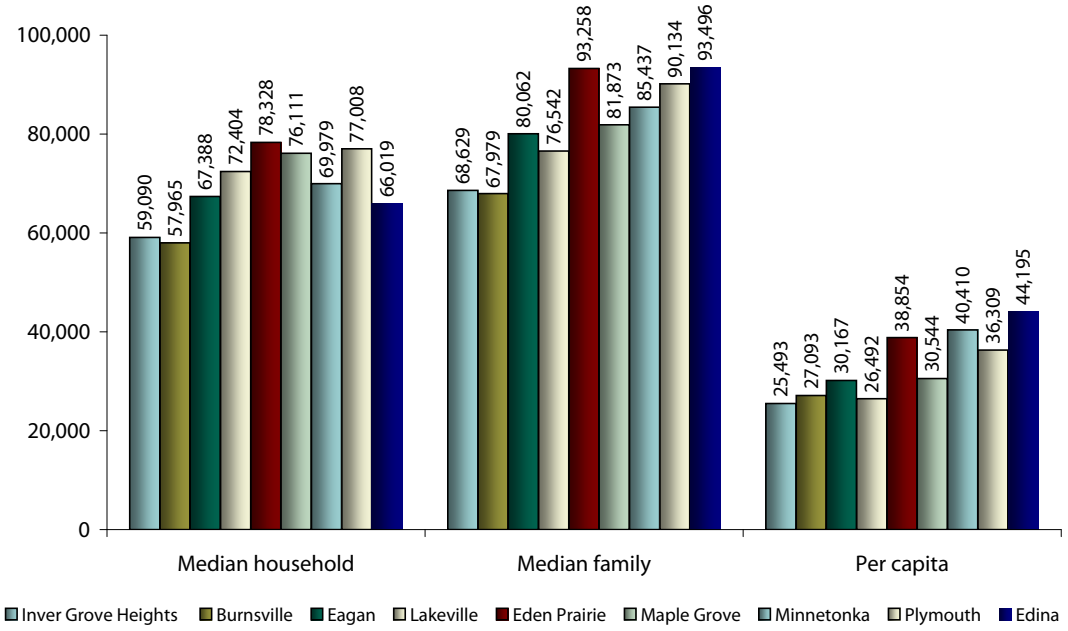
Place of Employment for Residents of Inver Grove Heights



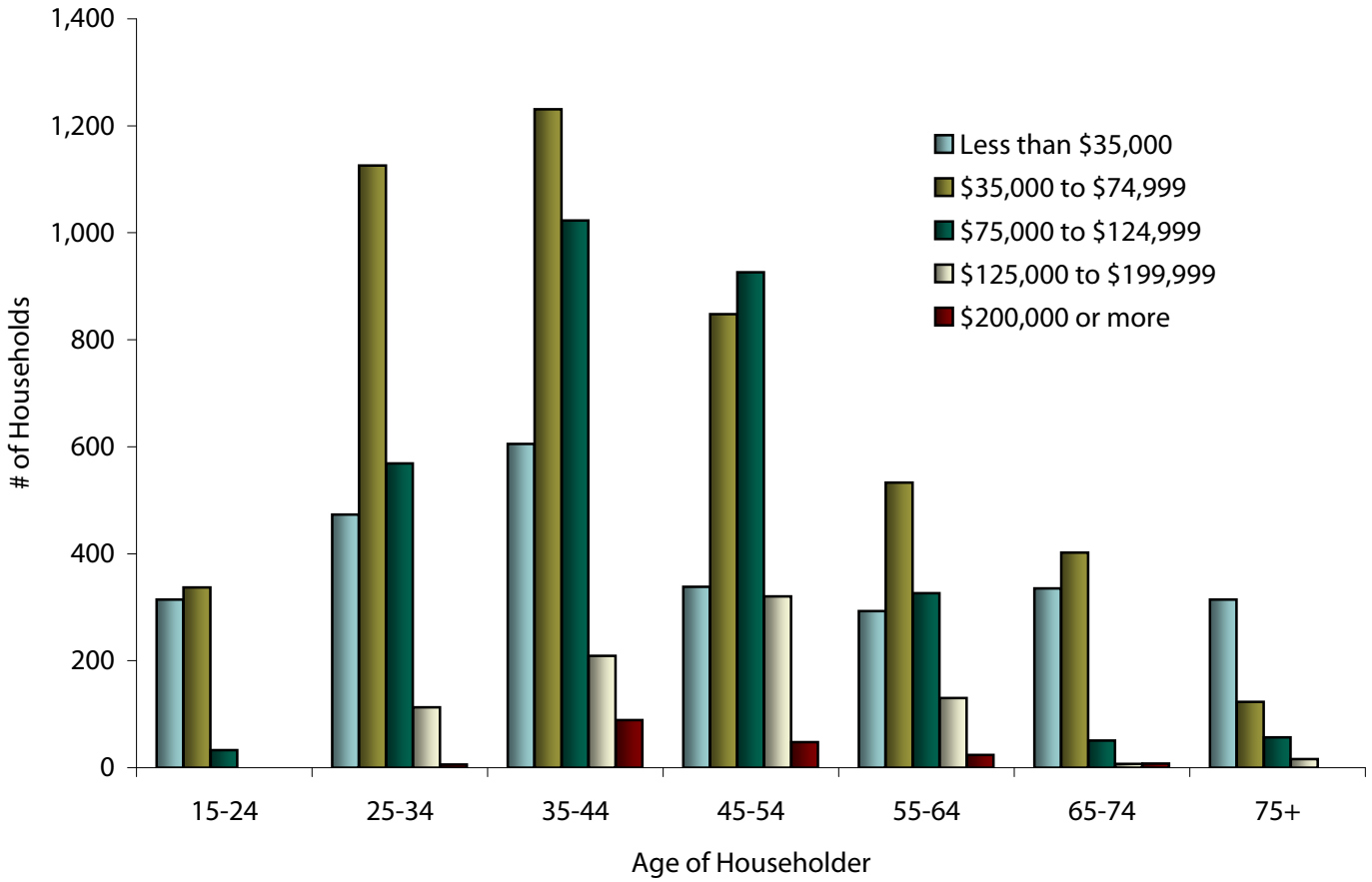
Income in 1999



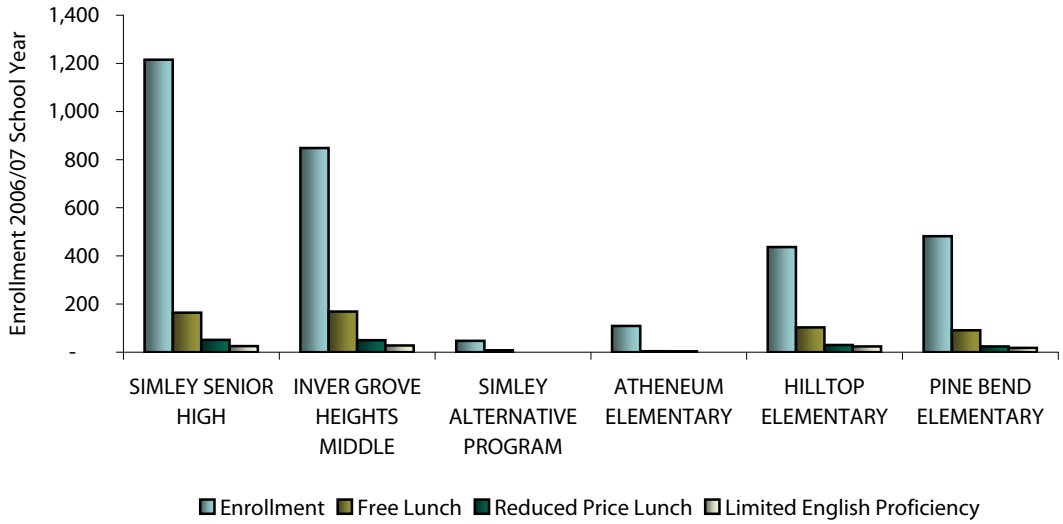




Household Income by Age of Householder

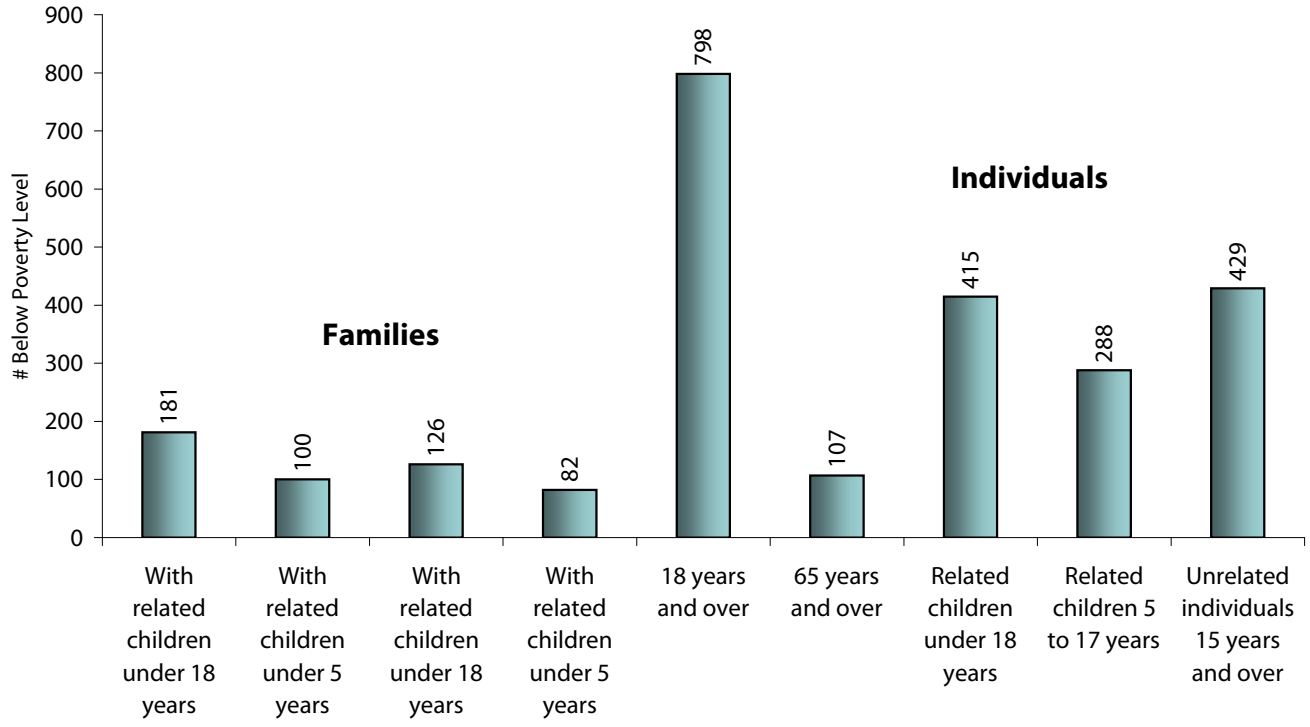


Elementary Schools and Socio-economic indicators

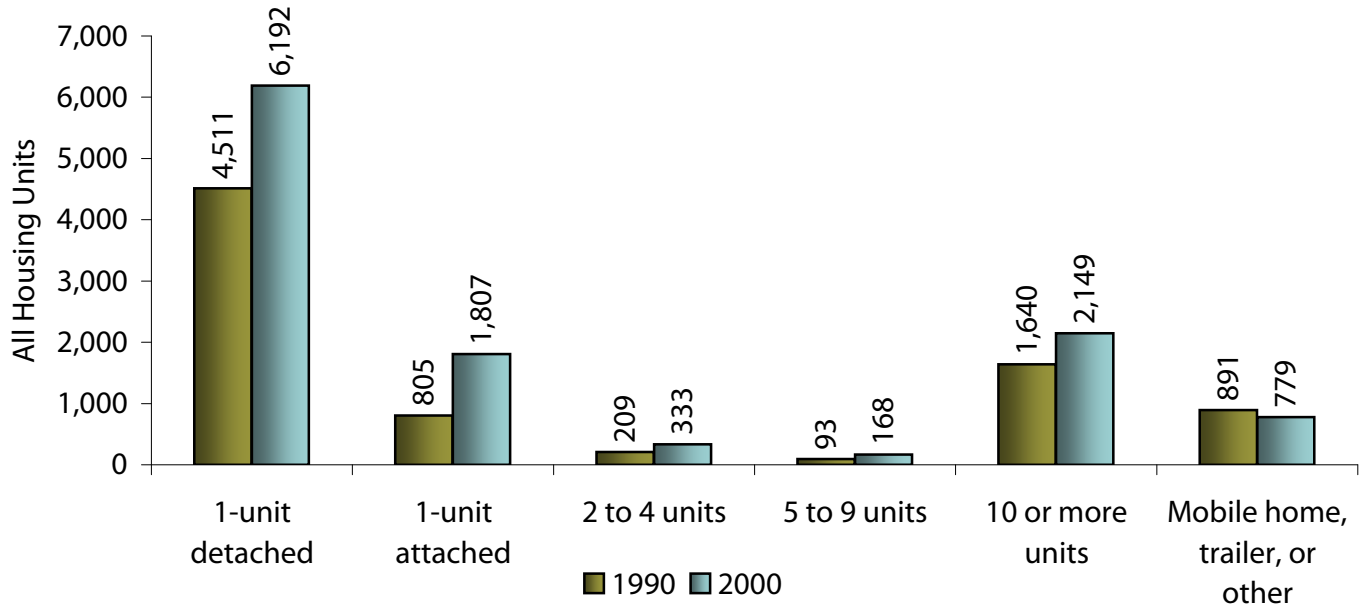


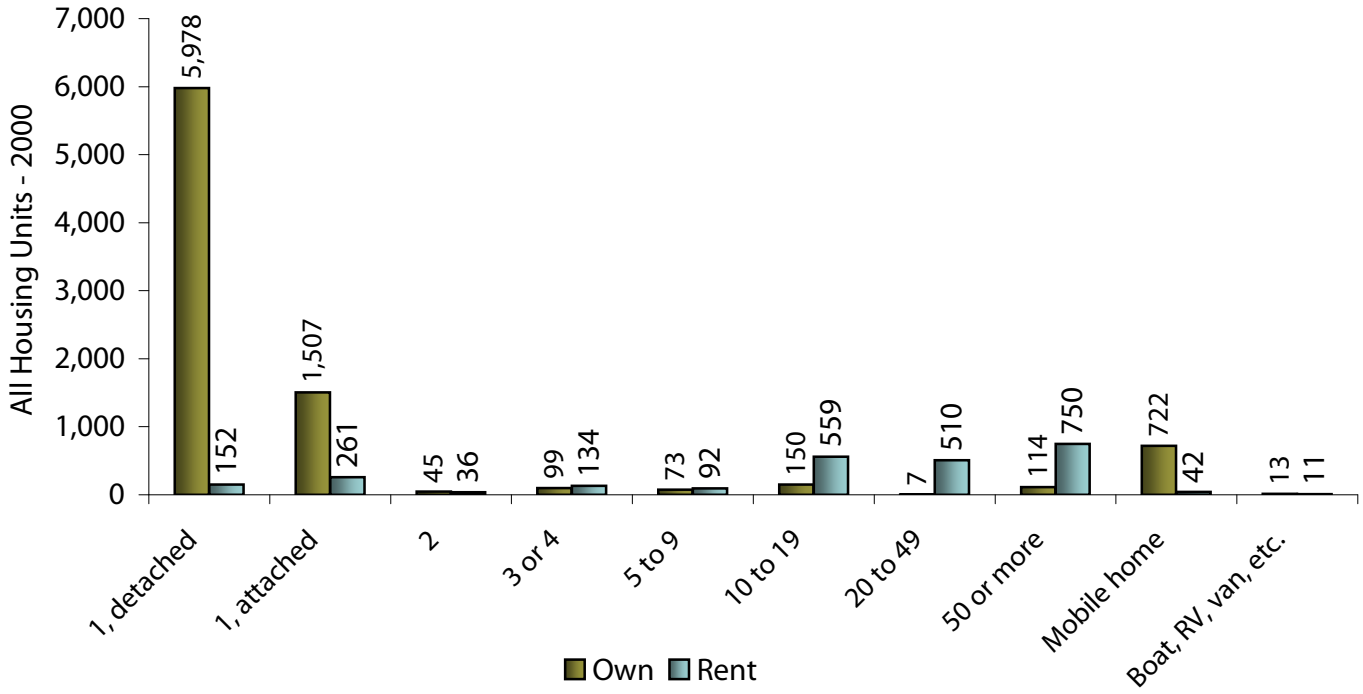
2007 Data	Enrollment	Free Lunch	Reduced Price Lunch	Limited English Proficiency	% Free + Reduced
SIMLEY SENIOR HIGH	1,215	164	51	25	17.7%
INVER GROVE HEIGHTS M	848	169	50	28	25.8%
SIMLEY ALTERNATIVE PR(	47	8	-	-	17.0%
ATHENEUM ELEMENTARY	109	4	3	-	6.4%
HILLTOP ELEMENTARY	437	103	30	24	30.4%
PINE BEND ELEMENTARY	482	91	24	18	23.9%
Total	3,138	22.2%			

Poverty Status

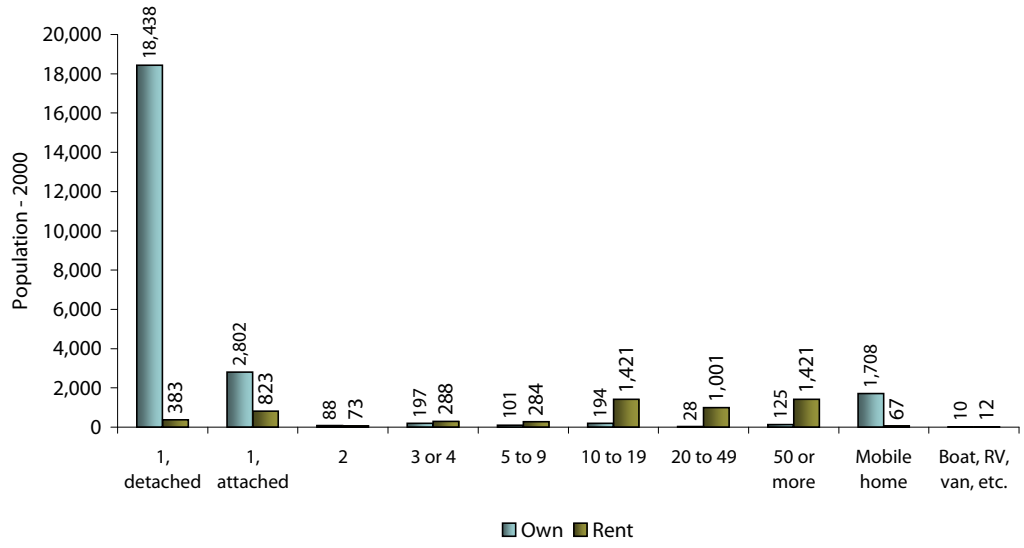


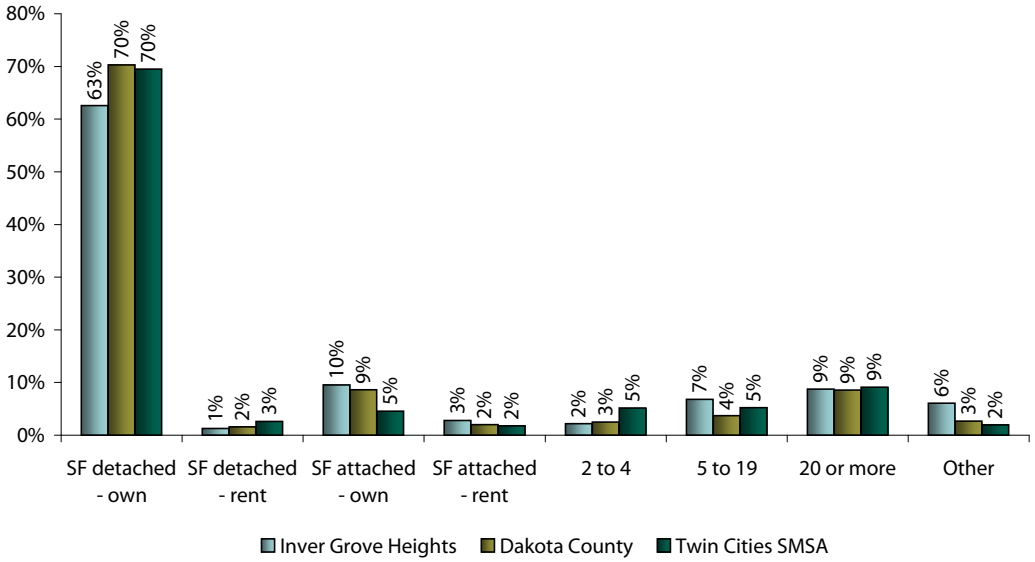
Housing Type

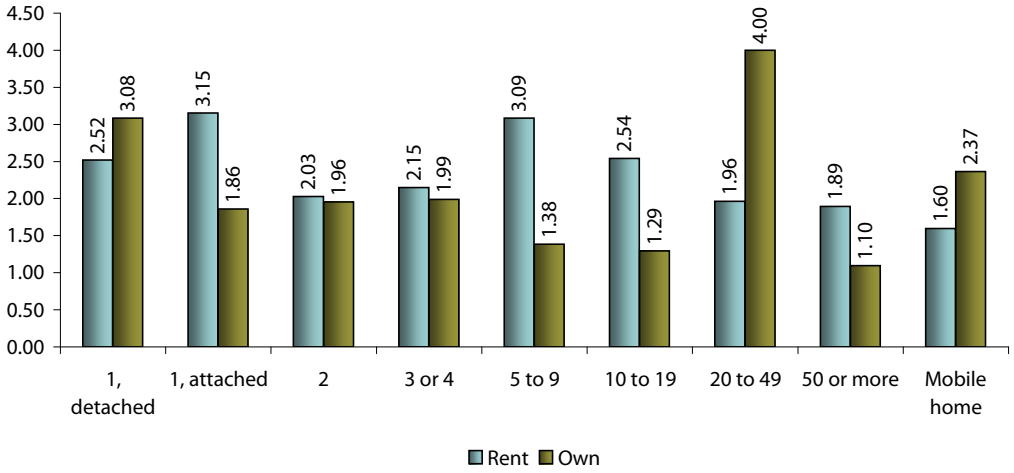




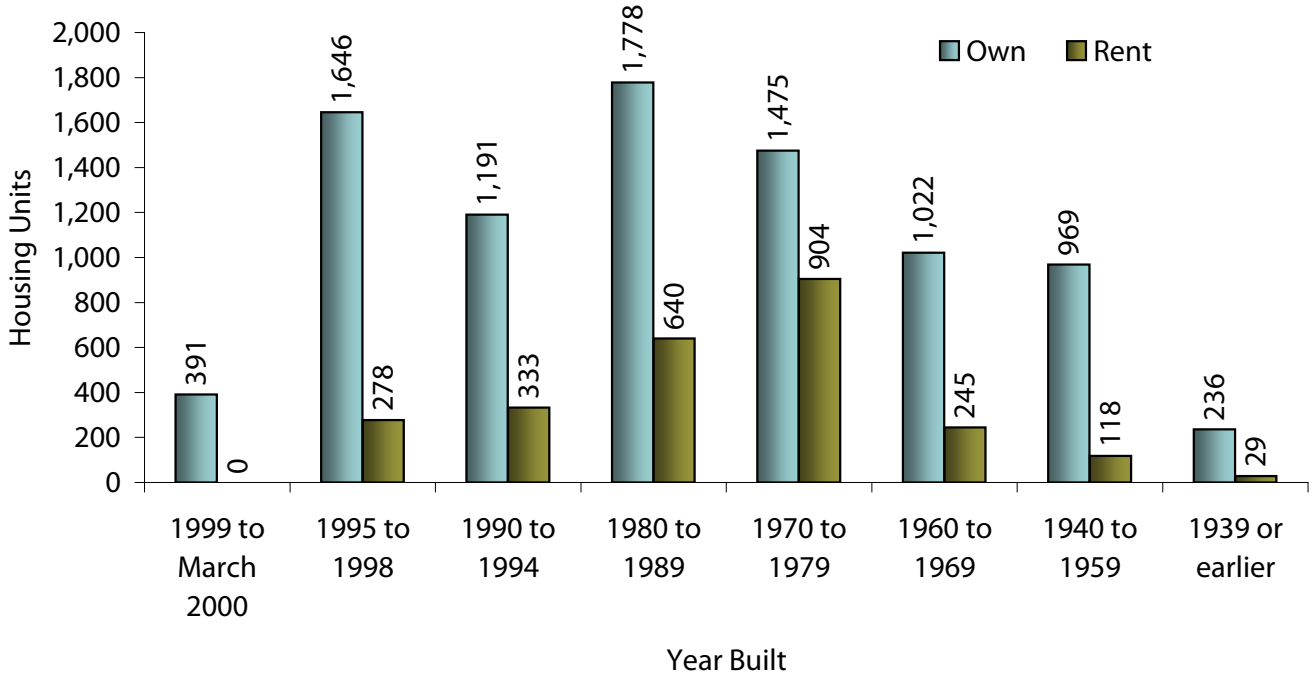
Housing Type and Population

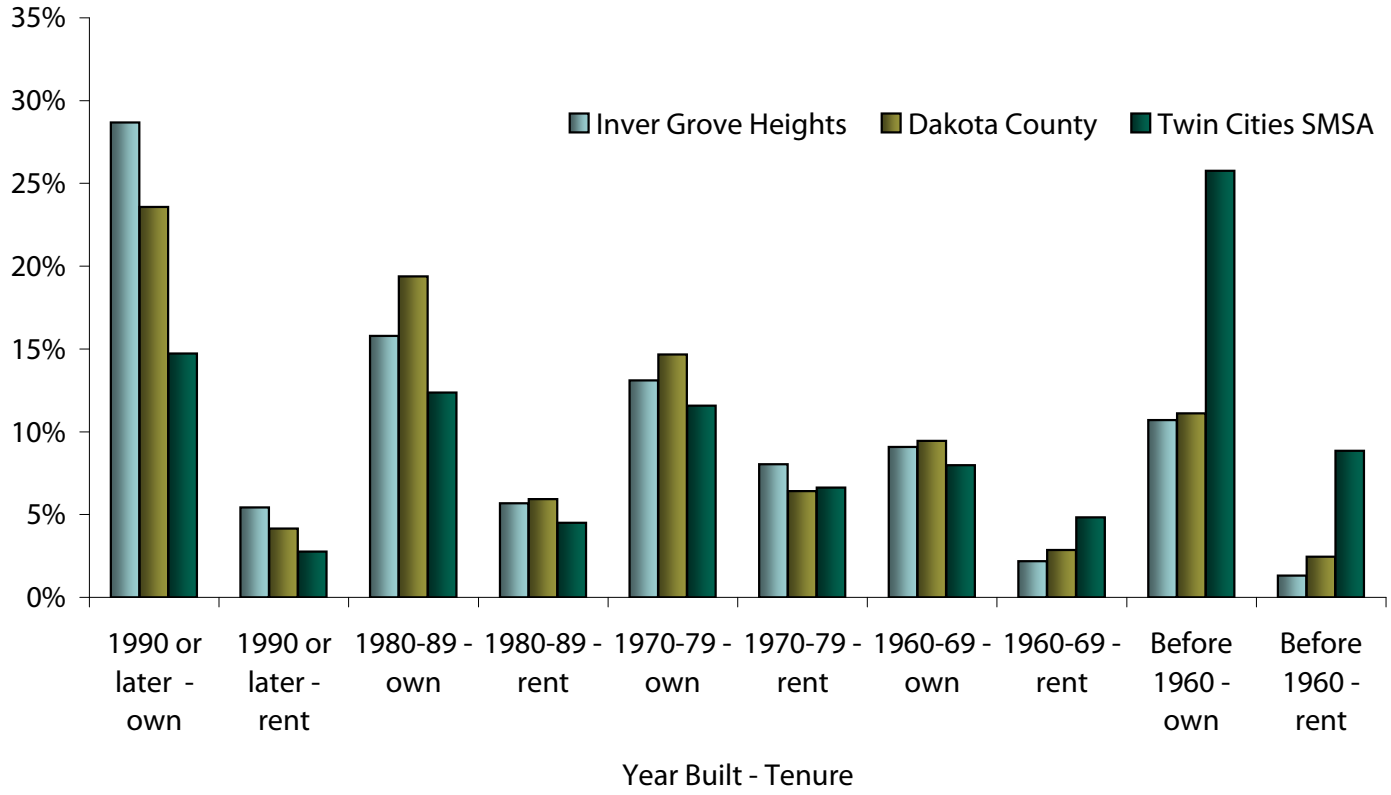




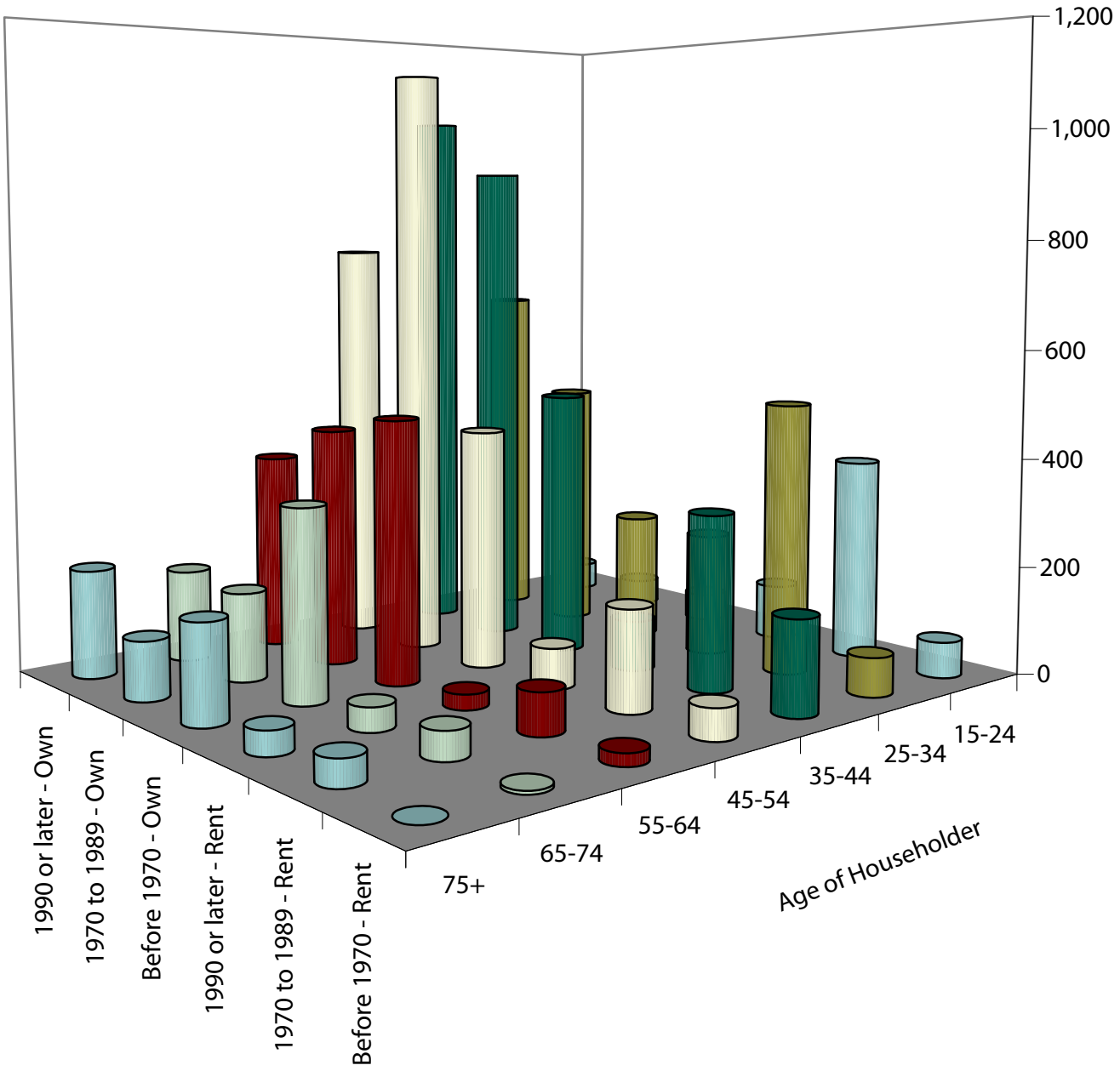


Year Structure Built



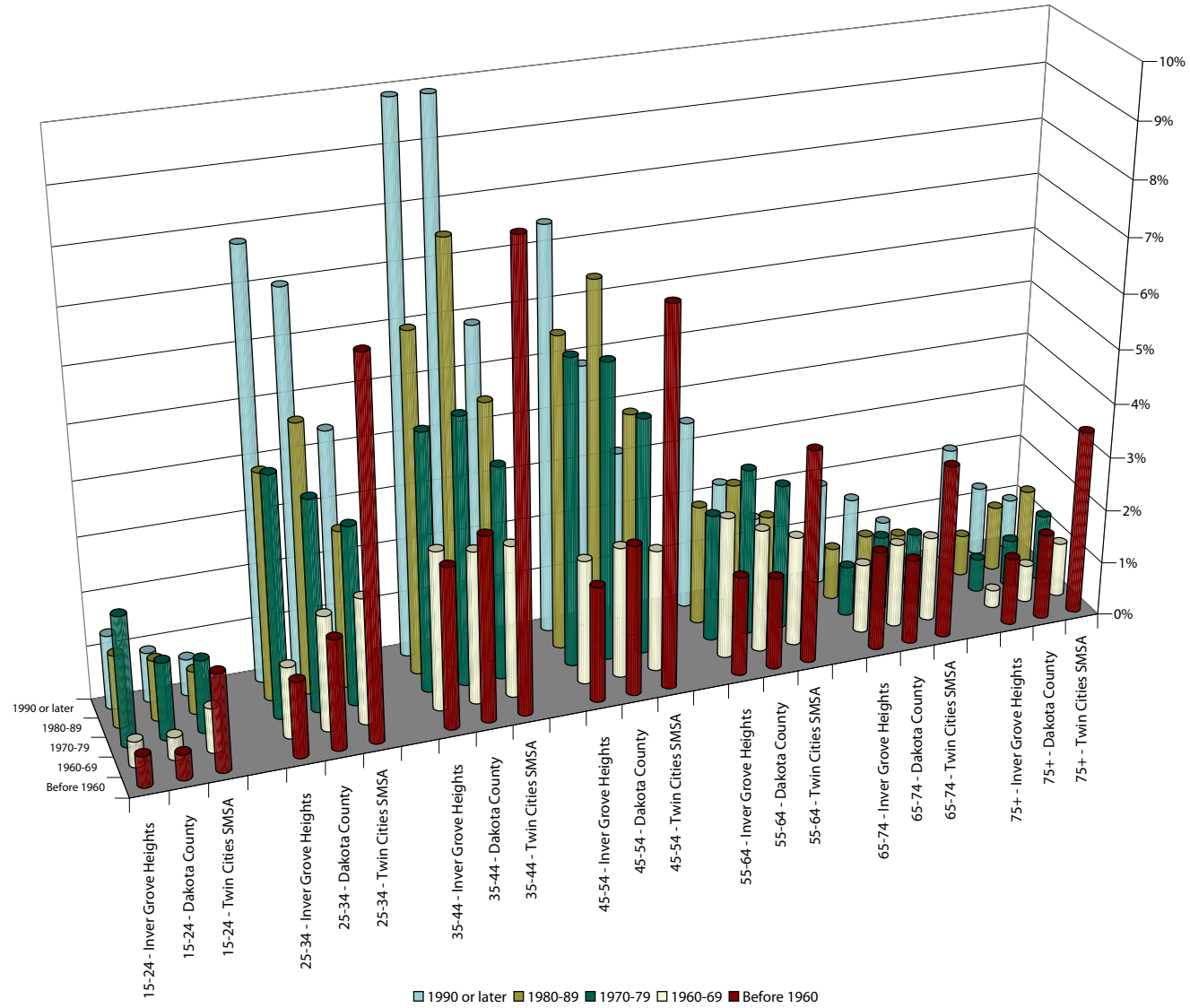


Age of Householder/Year Built/Tenure

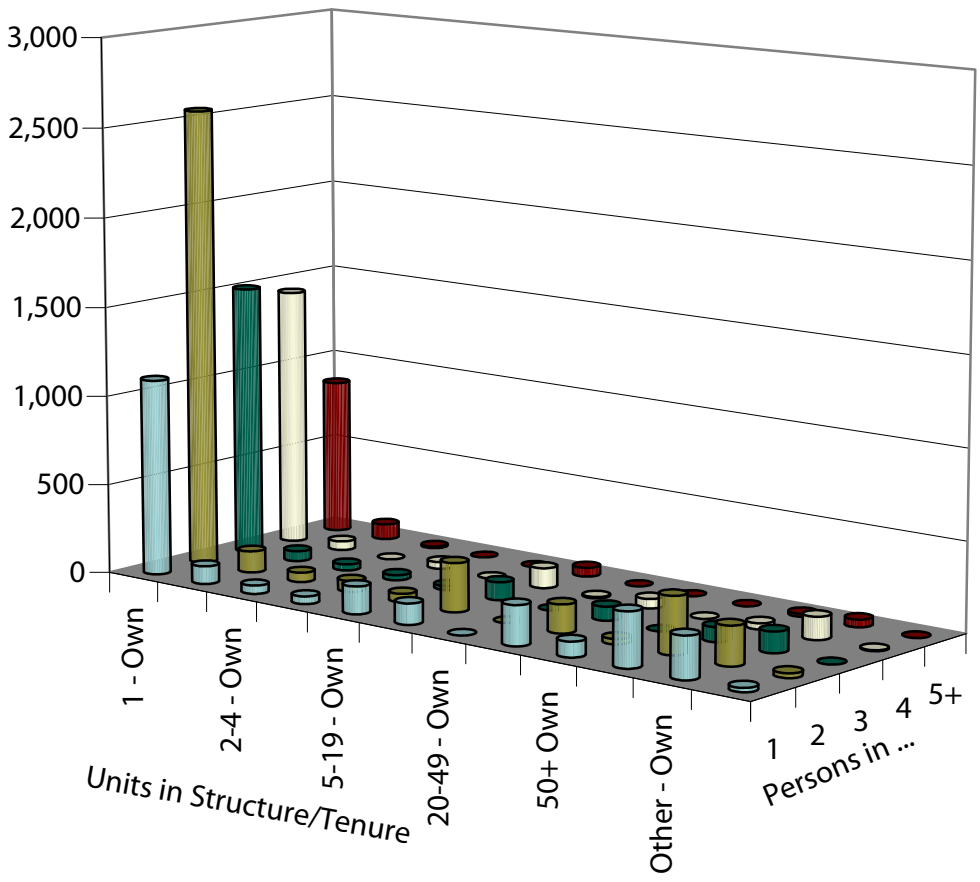


Age of Householder/Year Built

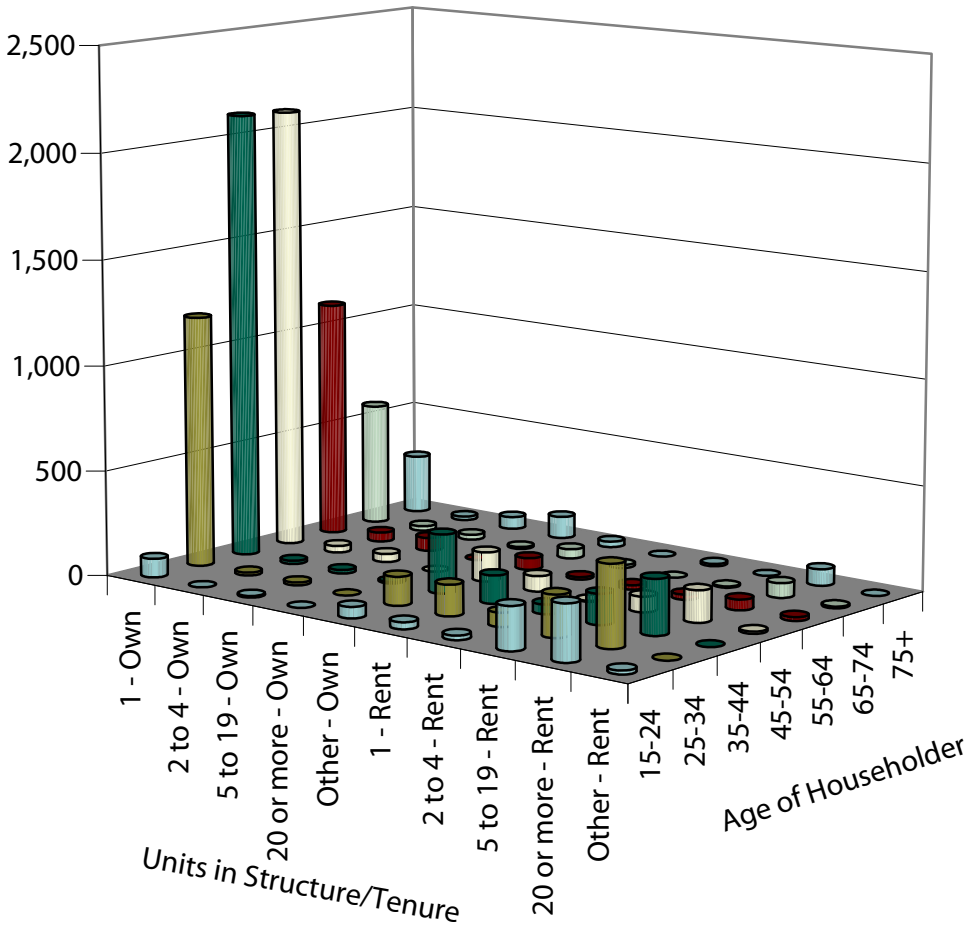
All Occupied Housing



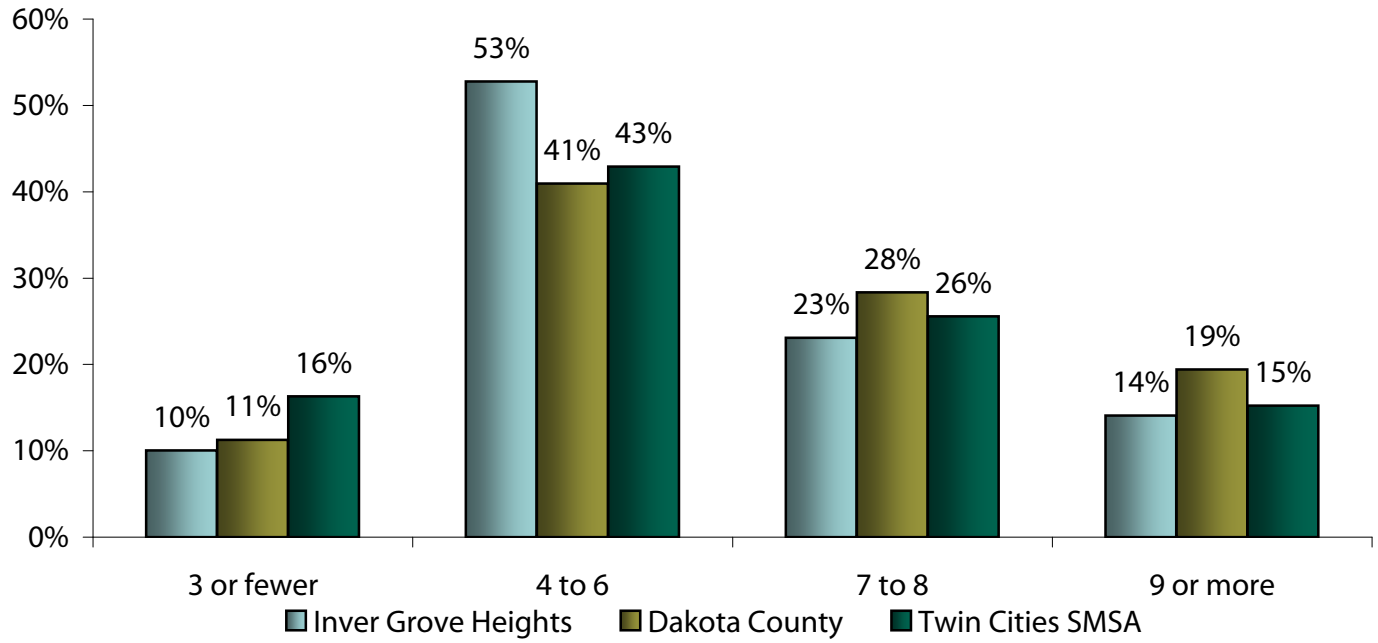
Units by Type/Household Size/Tenure



Units by Type/Age of Householder/Tenure

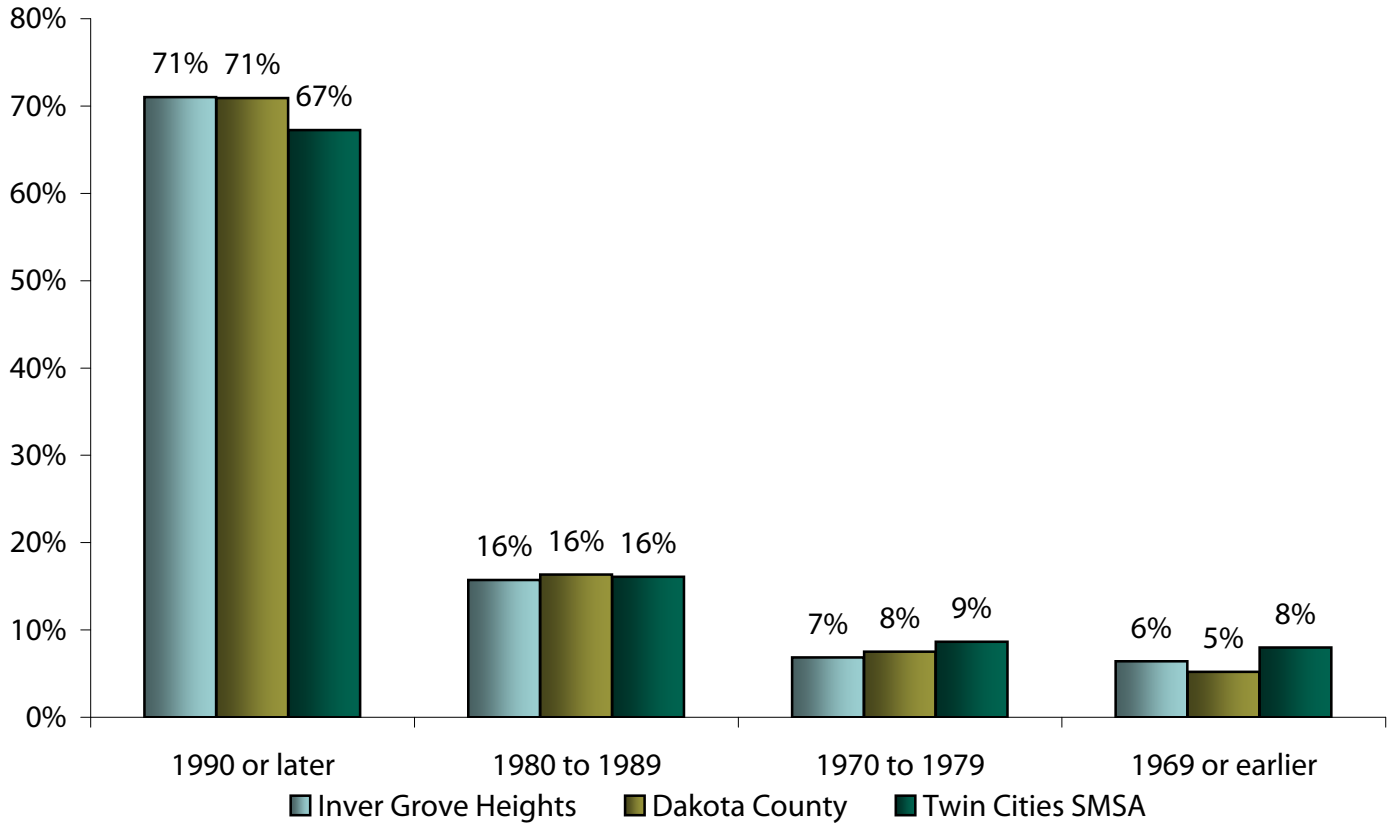


Number of Rooms

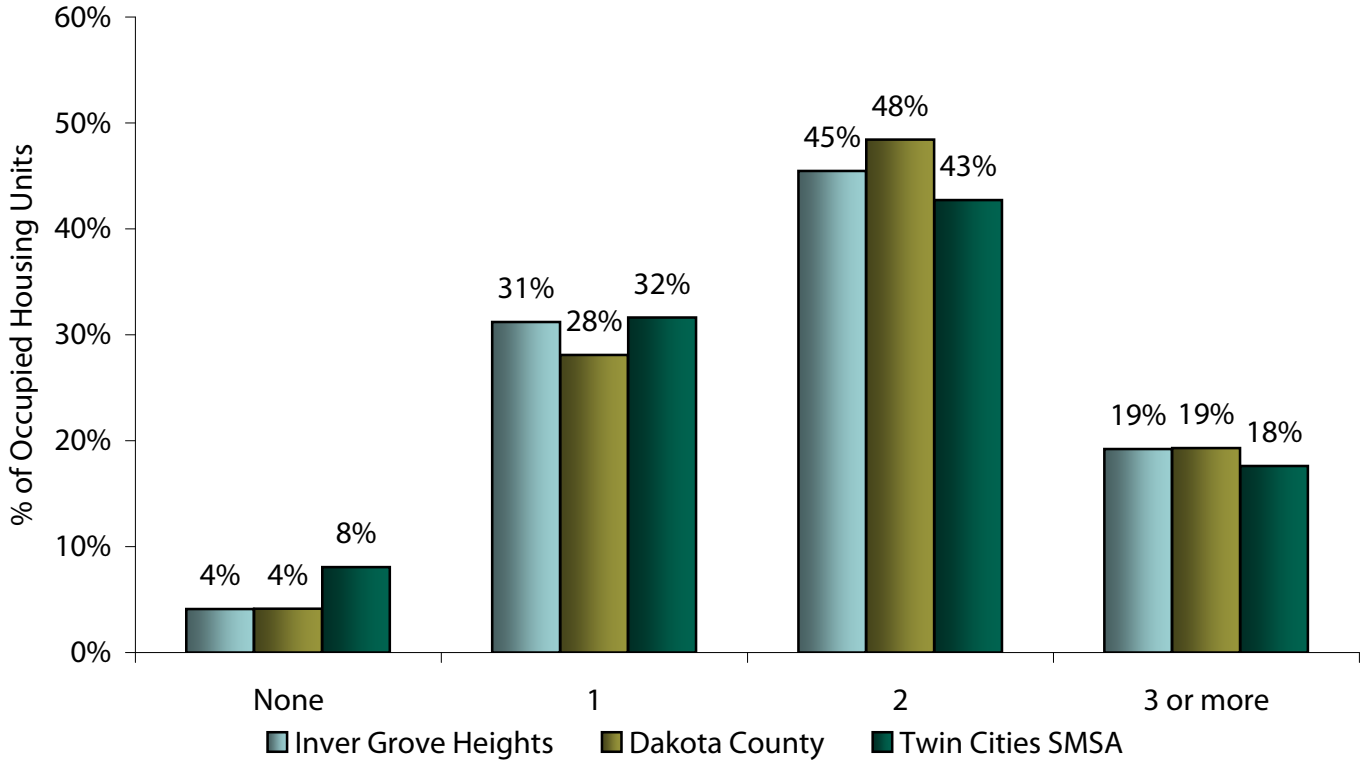


2000 Median for Inver Grove Heights - 5.7 rooms per unit

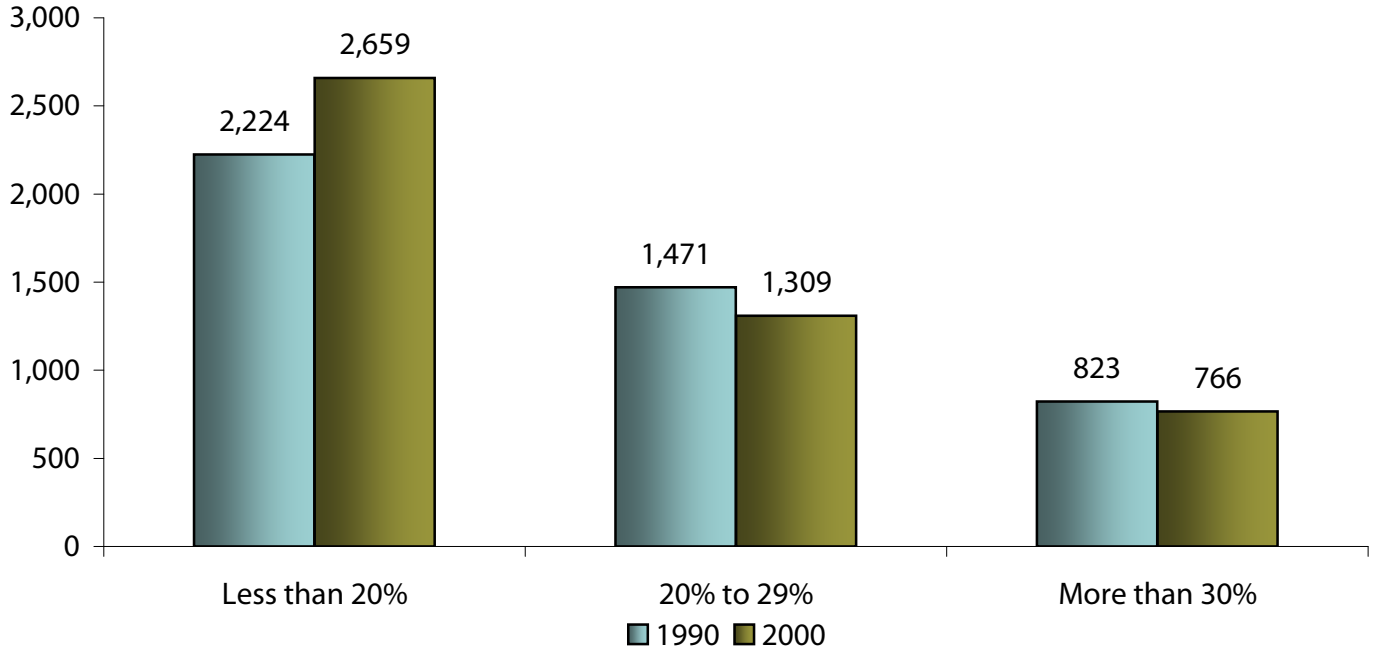
Year Householder Moved into Unit

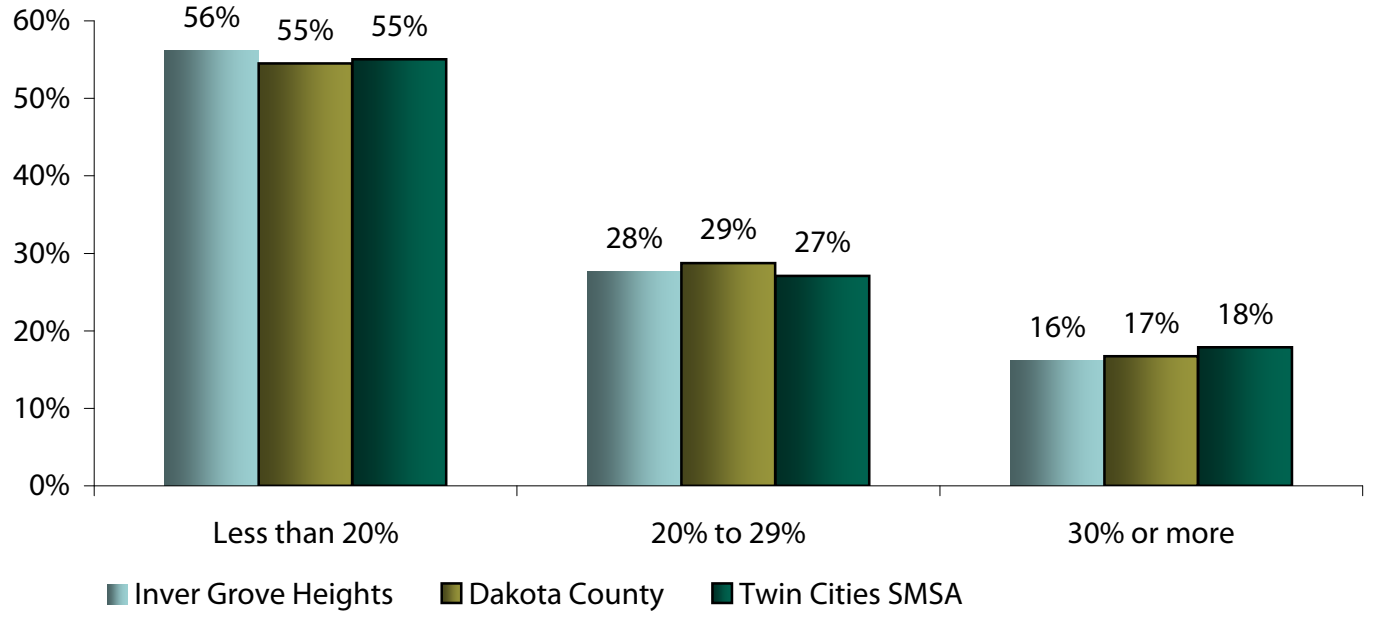


Vehicles Available per Occupied Housing Unit

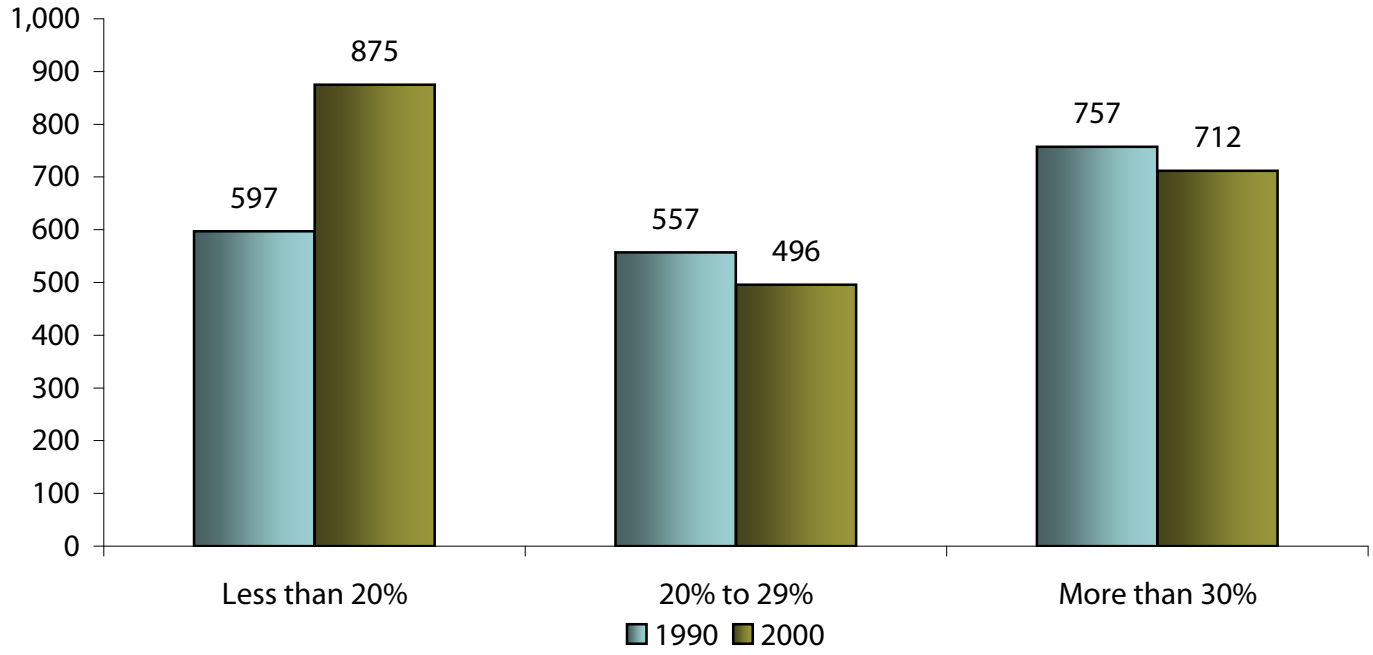


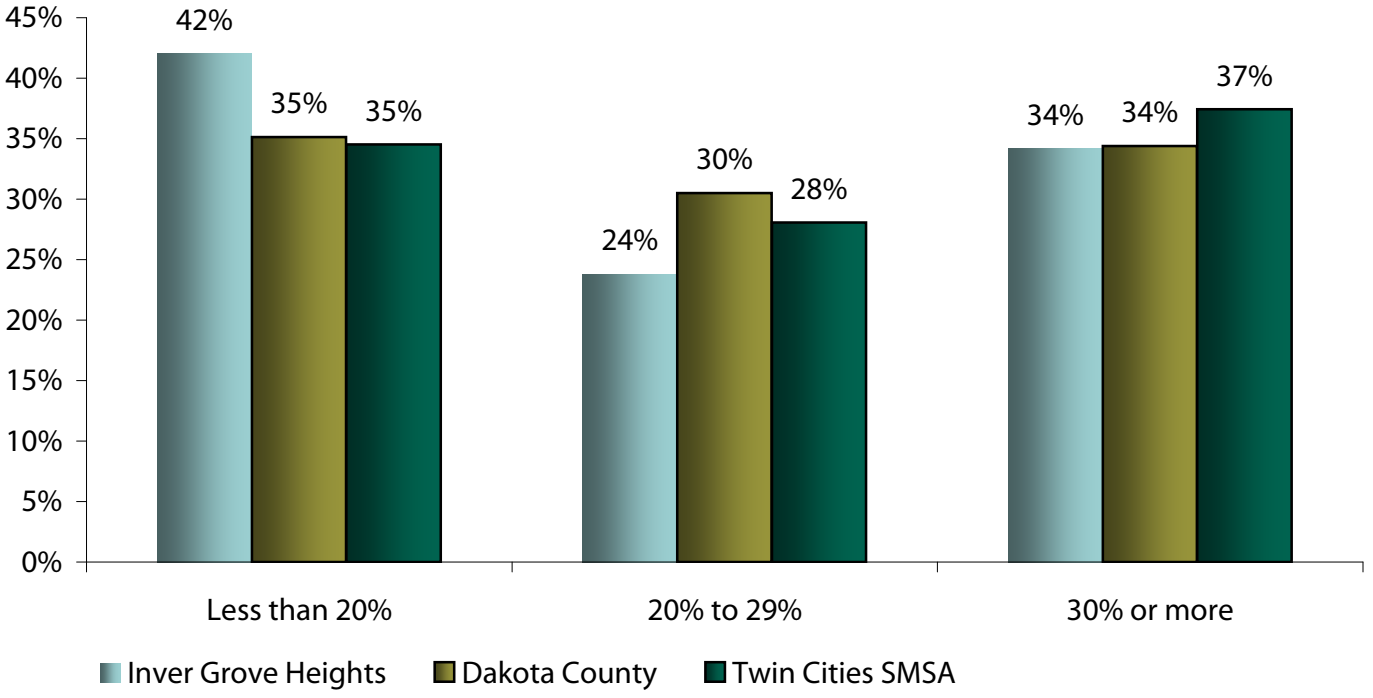
Selected Monthly Owner Costs as a % of Household Income





Gross Rent as a % of HH Income





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